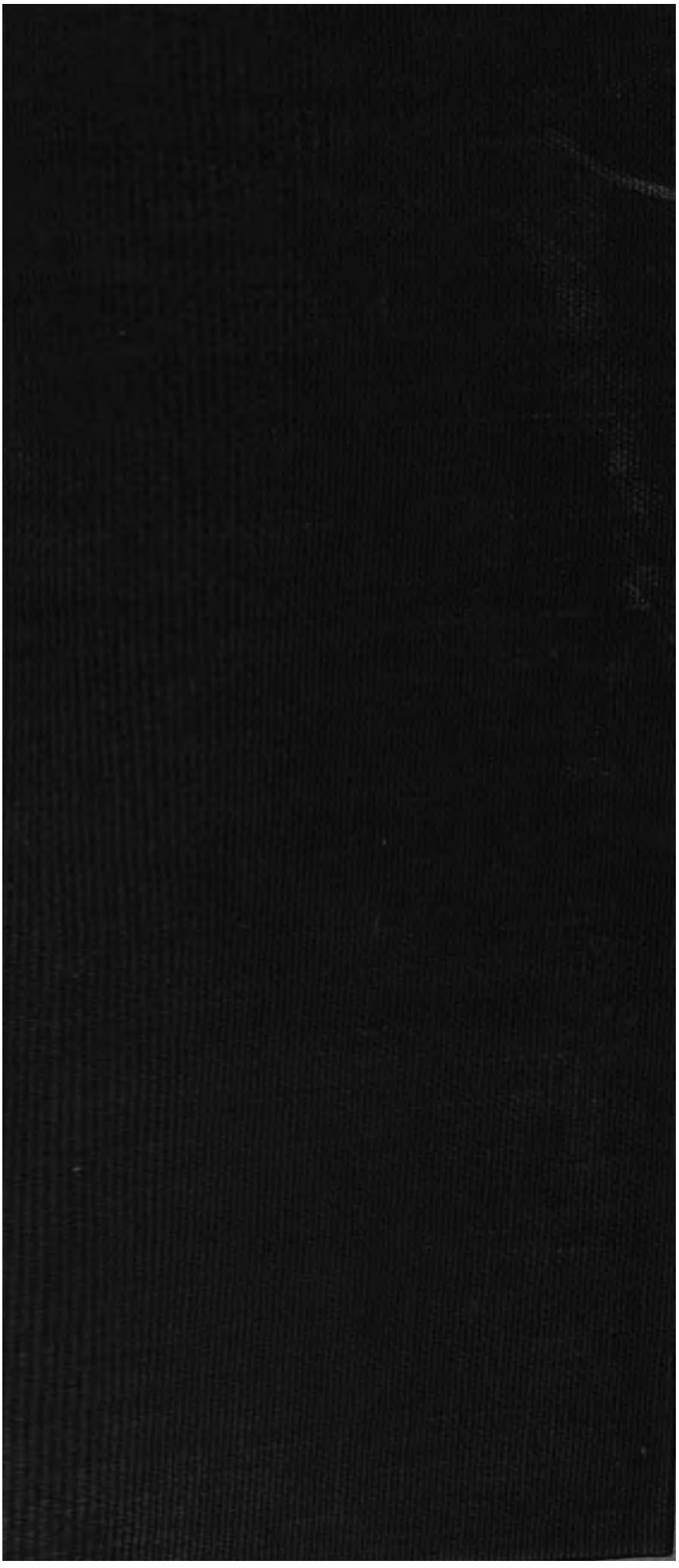


SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
LVX
FIAT
MDCCCLXVIII
EX LIBRIS

VOL. XIV., No. 1. JANUARY 1916

MAR 29 1916

Review of Neurology & Psychiatry

(Founded by the late Dr Alexander Bruce)

Editor

A. NINIAN BRUCE

M.D., D.Sc., F.R.C.P.E., F.R.S.E.

Assistant Editors

J. D. ROLLESTON
M.A., M.D.

S. A. KINNIER WILSON
M.D., B.Sc. Edin., F.R.C.P. Lond.

D. K. HENDERSON
M.D.

Supported by

J. SHAW BOLTON, Wakefield
J. MICHELL CLARKE, Bristol
C. C. EASTERBROOK, Dumfries
SIR DAVID FERRIER, London
HENRY HEAD, London
WALTER K. HUNTER, Glasgow
JOHN MACPHERSON, Edinburgh
HAMILTON C. MARR, Edinburgh
F. W. MOTT, London
RISIEN RUSSELL, London
SIR E. A. SCHAFER, Edinburgh
C. S. SHERRINGTON, Oxford
G. ELLIOT SMITH, Manchester
PURVES STEWART, London
ALDREN TURNER, London
W. B. WARRINGTON, Liverpool
R. T. WILLIAMSON, Manchester

Issued monthly. Annual Subscription, *including postage*, 25s.
$6.25; 30 *francs*; 25 *marks*; 32 *lire*

T. N. FOULIS, PUBLISHER
15 FREDERICK STREET, EDINBURGH
91 GREAT RUSSELL STREET, LONDON, W.C.

G. E. STECHERT & CO., 151 TO 155 WEST 25TH STREET, NEW YORK, U.S.A.

Price Half-a-crown net

CONTENTS.

ORIGINAL ARTICLE:— PAGE

A Case of Disseminated Sclerosis following Exposure, with Long Period of Remission. A. NINIAN BRUCE 1

ABSTRACTS:—

Psychology:—

(1) An Emperor's Madness, or National Aberration? E. LUGARO 4

Brain, Skull, &c.:—

(2) Injuries of the Superior Longitudinal Sinus. GORDON HOLMES and PERCY SARGENT 5

(3) Contused Wound of the Two Cerebral Hemispheres by a Fragment of Shell, Lesion of the Superior Longitudinal Sinus, Suppurative Meningitis, and Cerebral Abscess; Operation; Thrombophlebitis of the Longitudinal Sinus; Hernia Cerebri; Recovery. VANDENBOSSCHE 7

(4) Gunshot Wounds of the Head. SIR VICTOR HORSLEY 7

(5) Preliminary Notes on the Treatment of the Cranial Injuries of Warfare. PERCY SARGENT and GORDON HOLMES 8

(6) Surgical Notes on Serious Head Injuries. A. G. WHITEHORN-COLE 10

(7) Some Cases of Head Wounds. H. H. TAYLOR 10

(8) The Treatment of Gunshot Wounds of the Head, with Special Reference to Apparently Minor Injuries. J. E. H. ROBERTS 11

(9) Two Cases of Traumatic Double Hemianopsia, with Partial Recovery. C. E. H. MILNER 11

(10) Acute Septic Meningitis due to *B. Coli* following Skull Wound. C. E. H. MILNER 12

(11) Case of Shrapnel Injury to Right Parietal Cortex. H. M. ANDERSON and H. L. C. NOEL 12

(12) Bullet Wound of Left Posterior Central Convolution. A. PANSKY 13

(13) Traumatic Lesion of the Right Frontal Lobe. TOMMASO LUCHERINI 13

Spinal Cord:—

(14) Spinal Injuries of Warfare. GORDON HOLMES 13

(15) The Syndrome of Lesions of the Cauda Equina from Gunshot Wounds. CLAUDE and PORAK 15

Nerves:—

(16) French Neuropsychopathology during a Year of War (August 1914—August 1915). G. DENY 16

(17) Neuropathology of War: Wounds of the Peripheral Nerves. G. CATOLA 17

(18) Nerve Suture for Bullet Wounds. J. ATKINSON STONEY and H. MEADE 17

(19) Experiences in the Operative Treatment of Gunshot Injuries of Nerves. SIR FREDERICK EVE and R. S. WOODS 18

(20) Gunshot Injuries of the Peripheral Nerves. WILFRED HARRIS 19

(21) Gunshot Injuries to Peripheral Nerves. R. H. JOCELYN SWAN 19

(22) On the Use of a Sleeve of Vein in Nerve Suture. ANDREW FULLERTON 20

Neuroses, &c.:—

(23) Loss of Personality from "Shell Shock." ANTHONY FEILING 20

(24) Functional Nerve Disease and the Shock of Battle. DAVID FORSYTH 21

(25) The Psychology of Traumatic Amblyopia following Explosion of Shells. J. HERBERT PARSONS 23

(26) The Psychology of Traumatic Amblyopia following the Explosion of Shells. HUGH S. PEMBERTON 24

(27) The Treatment of "Concussion Blindness." ARTHUR F. HERTZ and ARTHUR W. ORMOND 25

(28) Three Cases of Concussion Aphasia: Treatment by General Anæsthesia. A. P. PROCTER 25

(29) Two Cases of Functional Aphonia (one including Functional Deafness) following the Bursting of a Shell in Close Proximity to the Patient. HERBERT TILLEY 25

(30) Functional Aphonia. J. F. O'MALLEY 26

(31) Paresis and Involuntary Movements following Concussion caused by a High Explosive Shell. ARTHUR HERTZ 26

"Frost-Bite":—

(32) So-called Frost-Bite of the Feet. L. A. LONGIN 26

(33) Frost-Bite. E. G. FEARNSIDES 28

(34) On the Prevention of "Frost-Bite" and other Effects of Cold. S. DELEPINE 29

(35) Trench-Foot or so-called "Frost-Bite." R. H. JOCELYN SWAN 30

(36) Frost-Bite in the Present War. C. MAX PAGE 30

(37) Some Observations on 376 Cases of "Frost-Bite." CHARLES MILLER 31

(38) A Note on "Frost-Bite." F. M'G. LOUGHNANE 32

(39) Frost-Bite. A. W. MAYO-ROBSON 33

(40) The Treatment of Painful "Frost-Bite." W. CHARLES DAVIS 33

(41) The Electrical Treatment of Trench-Foot and Frost-Bite. W. J. TURRELL 34

(42) On the Pathology of Trench Frost-Bite. J. LORRAIN-SMITH, JAMES RITCHIE, and JAMES DAWSON 34

REVIEW OF
NEUROLOGY AND PSYCHIATRY

REVIEW

OF

NEUROLOGY AND PSYCHIATRY

(FOUNDED BY THE LATE DR ALEXANDER BRUCE)

EDITOR

A. NINIAN BRUCE

M.D., D.Sc., F.R.C.P.E., F.R.S.E.

ASSISTANT EDITORS

J. D. ROLLESTON
M.A., M.D.

S. A. KINNIER WILSON
M.D., B.Sc. (EDIN.), F.R.C.P. (LOND.)

D. K. HENDERSON
M.D.

SUPPORTED BY

J. SHAW BOLTON, Wakefield
J. MICHELL CLARKE, Bristol
C. C. EASTERBROOK, Dumfries
SIR DAVID FERRIER, London
HENRY HEAD, London
WALTER K. HUNTER, Glasgow
JOHN MACPHERSON, Edinburgh
HAMILTON C. MARR, Edinburgh
F. W. MOTT, London
RISIEN RUSSELL, London
SIR E. A. SCHÄFER, Edinburgh
C. S. SHERRINGTON, Oxford
G. ELLIOT SMITH, Manchester
PURVES STEWART, London
ALDREN TURNER, London
W. B. WARRINGTON, Liverpool
R. T. WILLIAMSON, Manchester

VOLUME XIV.

EDINBURGH

T. N. FOULIS

15 FREDERICK STREET

91 GREAT RUSSELL STREET, LONDON, W.C.

1916

RC321
T4
v.14

BIOLOGY
LIBRARY

PRINTED AT
THE DARIEN PRESS
EDINBURGH

Contents

ORIGINAL ARTICLES

PAGE

A Case of Disseminated Sclerosis following Exposure, with Long Period of Remission. A. Ninian Bruce, M.D., D.Sc. - - - - - - - 1

Extreme Calcification in the Brain of a Subject with Mental Symptoms. A. E. Taft, M.D. - - - 57

The Possibility of Voice Inheritance. Walter B. Swift, M.D. - - - - - - - - 103

Transient Hemiplegia in Diphtheria. J. D. Rolleston, M.D. 145

Studies in Speech Disorder, No. 5—The Speech in Athetosis. Walter B. Swift, M.D. - - - 151

The Treatment of Functional Blindness and Functional Loss of Voice. A. Ninian Bruce, M.D., Temp. Capt., R.A.M.C. - - - - - - - 195

Focal and General Unilateral Brain Atrophy: Effects upon the Corpus Callosum. A. E. Taft, M.D. - 243

The Histology of Disseminated Sclerosis. I. Introduction. With a Preliminary Contribution by the late Alexander Bruce, M.D., LL.D., and James W. Dawson, M.D. James W. Dawson, M.D. - - - - - 285

The Histology of Disseminated Sclerosis. II. Historical. James W. Dawson, M.D. - - - - - 337

351523

PAGE

THE FINER HISTOLOGICAL CHANGES IN THE TRAUMATIC DEGENERATIONS OF THE SPINAL CORD, FOLLOWING BULLET WOUNDS OF THE CORD SUBSTANCE, OR SHOCK TO THE VERTEBRAL COLUMN. Aubrey Mussen, M.D. - - 417

A STUDY OF THE ANATOMICAL LOCATION AND HISTOPATHOLOGY OF NINETY-NINE BRAIN TUMOURS. Frederick B. Clarke, M.D. - - - - - - - 485

THE HISTOLOGY OF DISSEMINATED SCLEROSIS. III. METHODS OF INVESTIGATION. James W. Dawson, M.D. - - 541

Review
of
Neurology and Psychiatry

Original Articles

A CASE OF DISSEMINATED SCLEROSIS FOLLOWING EXPOSURE, WITH LONG PERIOD OF REMISSION.

By A. NINIAN BRUCE, M.D., D.Sc., Edinburgh.

A FEW years ago[1] I recorded a case of disseminated sclerosis in a man which was characterised by (*a*) the long duration of the periods of remission, the first lasting seven years, and the second six; and (*b*) by the amount of physical fatigue which the patient was able to endure (he fought through the Boer War during the first remission period), and by the skill in his finer movements which he acquired (he became one of the finest shots in his regiment). The length of the remission periods, however, gradually diminished until they ceased altogether, and the disease became permanently established in its later phases.

The following case, which recently came under my observation, is of similar interest, particularly as the period of remission—there has only been one up till now—was still longer, namely, *twelve* years.

The patient was a soldier, at present aged 48. He was married, and had seven of a family, all alive and well. He had always

[1] *Review of Neurol. and Psychiat.*, 1912, x., p. 65.

been a strong, healthy man (except for an illness to be later referred to), and had been able to endure great physical fatigue without any bad effects. He enlisted at the beginning of the war, but had not been sent out of this country. He was happy and contented with his work, and stated that he always "liked soldiering." During November 1915, while his regiment was stationed near Edinburgh, and was under canvas, he got thoroughly soaked during a long route march in very bad weather. It was a cold wintry day with sleet, snow, and rain, and when he returned he was wet to the skin, and both cold and tired. He sat down beside a fire and shivered for some time, after which he lay down on the floor and went to sleep, sleeping soundly the whole night long in his wet clothes, which he had never changed. In the morning he felt cold, and was perspiring profusely. On attempting to rise he found that he had lost the power of his legs. This passed off quickly, and he was able to get up and do his morning's work, but the weakness returned shortly, and became gradually so pronounced that he was unable to work, and reported sick in the course of the afternoon. He was sent to hospital, and although the legs had begun to improve after admission, he developed in addition tremors in both arms.

I saw him seven days after his reporting sick. He was then able to walk about slowly and with great difficulty by the aid of two sticks. Previously he had been confined to bed. He was a well developed, muscular man. He complained mostly of great weakness in both legs, pain in the back, and tremors in both arms whenever he tried to make any movement with them. Both knee jerks were exaggerated, and the plantar reflex was extensor on both sides. There seemed to be some disturbance of sensation, but nothing very definite could be established. The arms showed typical volitional tremor. There was marked nystagmus on looking to the left. There was also some bladder trouble during the last week, but this did not form a prominent symptom in his case.

He was quite cheerful about himself. He said that he had had an attack exactly like this twelve years ago, when he was employed as a labourer in the country, and that it had completely passed off in three weeks without anything being done for it. He was quite certain this attack would do the same.

His pupils were equal, round, and reacted to light and to

accommodation. The Wassermann reaction in the blood was negative, and he denied syphilis.

He was treated by rest, massage, and electricity, and improved so rapidly, that fourteen days later he said he felt so well that he asked to be returned to his depôt. His legs appeared to have completely recovered their power, he could walk without any assistance, and did not get fatigued. The volitional tremor diminished so rapidly that he could lift a tumbler full of water to his mouth without spilling it. The bladder symptoms completely passed away, but the nystagmus remained unaltered.

He was kept in hospital for another fortnight, and then sent back to his depôt. He seemed to be perfectly fit and well. An examination of his plantar reflexes, however, showed that although he had apparently recovered the full use of his lower limbs, both plantar reflexes remained extensor. No disturbance of sensation could now be detected.

An attempt to obtain a more detailed description of his earlier attack was not satisfactory. He said it was "just like this one," that his legs "went away from him," that he was in bed about a week, and that his arms shook in the same way as in this attack. During the intervening period of twelve years he had had no illnesses of any kind.

Whether he had had any earlier attacks still it was impossible to say, but it seemed probable that this was only his second attack. He had suffered from rheumatism badly as a boy, but apart from that could remember no other illness. His first attack came on after a very severe wetting, but during the twelve years between the attacks he had often been similarly exposed, and often slept in wet clothes without any bad effects.

Summary.—A brief description of a case of disseminated sclerosis in a soldier. He had received a severe wetting during a long route march, and had slept in his wet clothes. The symptoms developed suddenly next morning, and consisted of weakness in both legs, volitional tremor, and nystagmus. With the exception of the nystagmus, these had all vanished in three weeks. A history of a similar attack twelve years previously was given by the patient.

Abstracts

PSYCHOLOGY.

AN EMPEROR'S MADNESS, OR NATIONAL ABERRATION?

(1) (**Pazzia d'imperatore o aberrazione nationale.**) E. LUGARO, *Riv. di. Patol. nerv. e ment.*, 1915, xx., p. 365.

"THE war is the great reality of the moment, the constant thought of every one, the source of the only problems which, to-day, can interest those who do not live in the clouds."

These are the opening words of a remarkable essay in which Lugaro refutes the popular view shared by some psychiatrists, that the cause of the war is to be found in the personal influence of the two emperors, and especially Wilhelm II. He regards this as a dangerous error, because it tends to conceal the real culprit, who is not an individual, but the German nation. Even if the two emperors cannot be regarded as perfectly normal mentally, their anomalies have a negligible value in comparison with the far-reaching psychological and social causes which have brought about the war. "Francis Joseph's chin and Wilhelm's arm have not so much importance as Cleopatra's nose. Granted that Francis Joseph is mentally defective and morally insensible, his personal influence is of no account among the titanic forces which, in the centuries of history, have led to the formation of the Austro-Hungarian Empire and prepared its downfall. Wilhelm II. does not appear to be so inert a factor, but his effervescent action is only a reflex of the ideas prevalent in Germany. It may be that he is an epileptic; it is certain that he is superficial, restless, vain, and most ambitious, but he is not a man to make his mark on history. Of mediocre intelligence, he has never had a single original guiding idea; weak-willed, though of exuberant activity, he has always ended by sailing with the stream, and at the most he has allowed himself some impetuous act or inopportune gesture for which he has quickly had to make amends. Cabanes's view that Wilhelm's psychosis, if psychosis it can be called, has diffused itself throughout the nation, giving rise to a collective delirium, is decidedly erroneous. Neipp is nearer the truth when he says that Wilhelm's environment was fatal to his intellectual and moral development. . . . The national infatuation of the Germans is quite different from the collective psychosis seen among fanatical sects at the birth of a new religion. Though less grave from the psychiatric aspect, it is graver still owing to its social and political con-

sequences. It is the collective product of a slow development, favoured by political events, but based on the normal psychology of a whole people, reinforced by education, mutual suggestion, conscious propaganda, ties of interest, and consecrated by customs and laws." Collective aberrations, when they affect a whole nation, cannot be regarded like the insanity of an individual who is treated in an asylum. From the practical point of view, however, the same criticism should be applied to a fanatical people as to insane individuals, that of danger to others. Germany is a dangerous nation, and the first task of civilised Europe is to overcome her by force, without listening to her hypocritical calls for peace. But we must think of the future. When the crisis is over, relapses must be prevented.

"Can Germany be cured? The prognosis should be guarded, but is not desperate. . . . Collective delirium is more easily mastered than that of individuals." J. D. ROLLESTON.

BRAIN, SKULL, &c.

INJURIES OF THE SUPERIOR LONGITUDINAL SINUS. GORDON (2) HOLMES and PERCY SARGENT, *Brit. Med. Journ.*, 1915, Oct. 2, p. 493 (5 figs.); *Journ. Roy. Army Med. Corps*, 1915, xxv., July, p. 56.

THE vascular lesions of the brain met with in civil life are mostly due to arterial disease, to thrombosis, hæmorrhage, or embolism, while primary affections of the veins are uncommon. Gunshot wounds, on the other hand, tend rather to cause disturbance of the cerebral venous circulation by depression of fragments of the skull, the superficial course of the cerebral veins, their thinner walls and lower blood pressure rendering them more liable to be blocked by pressure than the arteries.

The most striking clinical effects are produced when the cranial sinuses, into which these cerebral veins flow, are affected, and the most common of these is the superior longitudinal sinus. The superior lateral cerebral veins usually unite into four principal trunks, a frontal, a precentral, a postcentral, and an occipital. Of these the postcentral is usually the largest, and as it drains the central gyri, the most important. As a rule these veins do not open directly into the sinus, but into thin-walled lacunæ that project from it over the lateral as well as over the mesial surface of the hemisphere. The parietal lacunæ may often spread at least 2½ cm. on to the convexity of the hemisphere, so any depressed bone or direct injury may block the venous circulation of the upper parts of the central gyri. Different groups of symptoms are

produced by lesions of the different lacunæ, and this paper is limited to a description of those due to disturbance of the circulation through the parietal lacunæ, when the symptoms are chiefly due to disturbance of motion and sensation.

The authors have seen seventy cases in which the superior longitudinal sinus was injured, or the circulation in the lateral lacunæ disturbed. In many there was no direct damage to the brain, either by the projectile or by depressed fragments of bone.

Pathologically a thrombus was usually found in the longitudinal sinus, probably not occupying the whole lumen. The superficial cortical veins which enter the sinus at the position of the wound were swollen, firm to touch, and could not be emptied by pressure. The cortex drained by these veins was usually swollen, and the convolutions flattened by pressure against the skull. On section, the œdema was very marked with minute hæmorrhages, but rarely actual softening.

In twenty cases all the limbs were affected; in thirty-one both legs and one arm were weak; in sixteen only the lower limbs were involved; in six the symptoms were mainly hemiplegic, and in five one leg alone presented any palsy. The distribution of the paralysis, and its severity in different segments of the limbs, is peculiar. The more proximal segments of the upper limbs are most seriously paralysed, and the weakness diminishes distalwards. A definite paralysis of the face or tongue is extremely rare, and speech is never affected. The trunk muscles may be involved, especially those of the back. The distribution of the palsy in the legs is the converse of that of the arms; here the distal movements suffer more severely than the proximal. This, of course, all depends upon the arrangement of the cortical motor centres and the cortical veins.

Even more striking than the distribution of the paralysis is the rigidity which is always associated with it. It is often so great that the resistance to passive movement is extreme. Peripheral stimulation increases the rigidity. It is well marked within twenty-four hours of the infliction of the wound, and may come on almost at once. It gradually diminishes with any return of power. The absence of any evidence of shock is also remarkable. The venous thrombosis thus produces a pure cortical paralysis unaccompanied by any shock effect on the subcortical centres which subserve muscle tone.

Appreciation of pain and temperature is unaffected, and there is no diminution of tactile sensibility. On the other hand, localisation of tactile stimuli, the recognition of the position and of passive movements of the limbs, and of form, shape, and size, as well as the discrimination of compass points, may be seriously disturbed.

As a rule the functions of the cranial nerves were unaffected, but occasionally the eye movements were disturbed. Bladder symptoms occurred now and then. Fits were observed in ten cases. Other complications were rare. The general symptoms of intracranial pressure were usually pronounced, most of the patients suffering from headache. In five there was definite optic neuritis.

Among thirty-nine cases operated upon, fifteen died, while only one unoperated case died. Uncomplicated cases show a remarkable tendency to improve. If operation is necessary, the bone all round the depressed portion should be removed, and then it should be elevated. Hæmorrhage can be controlled easiest this way. Bleeding can best be arrested by placing a piece of pericranial tissue or muscle on the laceration, and carefully replacing the scalp flap over it. A gauze plug tends to produce further thrombosis. A subdural hæmorrhage is uncommon. Increased intracranial tension may be relieved by lumbar puncture or a subtemporal decompression. A. NINIAN BRUCE.

CONTUSED WOUND OF THE TWO CEREBRAL HEMISPHERES BY A FRAGMENT OF SHELL, LESION OF THE SUPERIOR LONGITUDINAL SINUS, SUPPURATIVE MENINGITIS, AND CEREBRAL ABSCESS; OPERATION; THROMBOPHLEBITIS OF THE LONGITUDINAL SINUS; HERNIA CEREBRI; RECOVERY. (**Plaie contuse des deux hémisphères cérébraux par éclat d'obus, lésion du sinus longitudinal supérieur, méningite suppurée et abcès cérébral; intervention; thrombophlébite du sinus longitudinal; hernie cérébrale; guérison.**) VANDENBOSSCHE, *Presse Méd.*, 1915, xxiii., p. 330.

(3)

CASES of thrombophlebitis of the superior longitudinal sinus are rare, and recovery is exceptional. The hernia cerebri in this case was situated in the Rolandic fissure, and was accompanied first by complete right hemiplegia, and then by paresis of the extremities. J. D. ROLLESTON.

GUNSHOT WOUNDS OF THE HEAD. Sir VICTOR HORSLEY, *Brit. Med. Journ.*, 1915, Feb. 20, p. 321 (5 figs.); *Lancet*, 1915, Feb. 20, p. 359.

(4)

As the results of experiments upon modelling clay, which roughly resembles tissues, it was found that the so-called explosive effect was directly proportional (1) to the sectional area of the bullet; (2) to its velocity; (3) to the amount of water in the substance through which the bullet passes; and (4) that the forces of disruption were at an angle to the axis of flight of the bullet

which could not completely be determined. The larger aperture of exit necessarily results from the driving out of all the fragments of tissue, bone, and particles of fluid to which the velocity of the bullet had been communicated. The most important movement of the bullet is not the progression forward, but the rotatory spin given to it by the rifling. The injury being proportional to the sectional area, it does not matter whether the bullet enters by its pointed apex or its flat base. Turning over of the bullet does not do much harm, the real cause of destruction of tissue being the high velocity and the rapid spin. The high velocity of the bullet being imparted to bodies lighter than itself may cause penetration of the brain by a fragment of bone further than the shot itself, and such fragments may be infected.

Death may be caused by: (1) Fatal concussion without penetration of the skull, apparently due to direct paralysis of the respiratory and cardiac centres in the bulb. (2) Rise of intracranial pressure. The first effect of a gunshot wound to the head is functional inhibition of the respiratory centre. Force applied to the frontal region is transmitted by the cerebro-spinal fluid to the interior of the ventricles and the fourth ventricle. Immediate hæmorrhage still further raises the intracranial pressure. Immediate operation may save many of these cases. (3) Sepsis, due to incomplete disinfection of original wound. If the subdural space becomes infected, it should be opened, disinfected by irrigation with repeated lumbar puncture and autogenous vaccine treatment. (4) Hernia cerebri, if aseptic, tend to remain only just so long as there is increased intracranial tension. If septic, may denote general cerebritis and spreading infective œdema of brain. The best treatment is absolute alcohol and removal of necrosed areas.

In the adult there is no evidence of compensation by education or substitution of function in other parts of the brain for function lost by permanent destruction of given areas. Recovery due to absorption of hæmorrhage, &c., may go on for years if not interrupted by epilepsy or secondary mental changes. Judging from the Boer War, the chief movements of the hand are not restored if the whole arm area of the anterior gyrus has been destroyed. A. NINIAN BRUCE.

PRELIMINARY NOTES ON THE TREATMENT OF THE CRANIAL (5) INJURIES OF WARFARE. PERCY SARGENT and GORDON HOLMES, *Brit. Med. Journ.*, 1915, March 27, p. 537.

THREE main groups are found:—

1. Where there has been a glancing blow, or where the wounds of entry and exit in the scalp lie so close together as to form practically a single lesion.

2. Where the missile has entered and remains within the cranial cavity.

3. Where the missile has traversed the cranium.

1. This is the most common type of case seen in base hospitals. Unless urgent cerebral symptoms demand immediate relief, it is best to delay operation for two or three days, to make the wound reasonably clean. Immediate operation must be considered if the patient remains deeply unconscious for some time, as this may be due to cerebral compression, but it is essential to establish this clearly as the cause.

The flap must always be so planned as to provide for the widest craniectomy that may be required. The size of the bony opening must be such as to allow a sufficiently wide incision of the dura mater to afford complete relief of the existing pressure, and prevent the possibility of strangulation of extruded brain tissue by pressure of its periphery against the dural opening. In closing the wound it is necessary to avoid placing a dirty scalp wound in contact with exposed and lacerated brain. Three methods were tried: (*a*) Placing a sheet of "*Cargile membrane*" (peritoneum of ox) on the under surface of the flap so as to interpose a barrier between it and the brain. This proved unsatisfactory, as it provoked a continuance or increase of suppuration, and required removal later. (*b*) *Dural flap.* This proved satisfactory where practicable, but extensive laceration of the dura by the original wound prevented its frequent use. (*c*) *Pericranial flap.* The pericranium is detached by undercutting for a wide area round the wound, and by suitable incisions one or two flaps can be made and sutured across the scalp defect.

Gauze drainage is bad, as it adheres to the brain and wound. Rubber tubing is too hard and rigid. The best is a loose roll of thin sheet rubber.

2. If possible, missiles in the cranial cavity should be removed. The ultimate fate of a missile remaining embedded in the brain is uncertain.

3. Cases under this heading come to be dealt with as in 1, unless they have previously been operated upon, in which case pus and a cerebral fungus were usually present. The best treatment was a clean contralateral decompression, as a local decompression merely causes spread of infection.

A *fungus cerebri* means a strangulated, disintegrated, and partly necrotic mass of brain matter, which forms a cauliflower-like structure connected with the intracranial contents by a relatively narrow pedicle.

A *hernia cerebri* is the protrusion of relatively intact brain matter covered by unruptured pia mater through an opening sufficiently large to avoid any danger of its strangulation.

A. NINIAN BRUCE.

SURGICAL NOTES ON SERIOUS HEAD INJURIES. A. G. (6) WHITEHORNE-COLE, *Lancet*, 1915, clxxxviii., March 13, p. 548.

SEVEN cases are reported.

Case I.—Vertex of skull for an area of five to six inches smashed in, being reduced to small fragments, one of which blocked the superior longitudinal sinus. The dura and underlying brain tissues were very considerably damaged. Patient comatose, with stertorous breathing. No paralysis. Improving since operation.

Case II.—Greater part of left parietal bone, and adjoining part of left occipital and frontal bones fragmented. The right parietal bone was loose. The brain and underlying tissue much damaged, and patient showed aphasia and right hemiplegia. After operation the hernia cerebri gradually disappeared, and he can now read, talk, and walk.

Case III.—Outer portion of frontal bone and orbital plate fragmented, and fissure extending through temporal bone to exit of bullet at zygoma. Semi-conscious; good progress after operation.

Case IV.—Hole in parietal bone about size of a shilling; hernia cerebri, left hemiplegia, and semi-consciousness. After operation hemiplegia gradually improved, and mental condition unimpaired.

Case V.—Rifle bullet wound, entry being small and in frontal bone three inches above inner canthus of right eye. Exit wound in left temporal region, and about size of half-a-crown. Brain matter was oozing from both wounds. Greater part of frontal bone, supraorbital plate, and portion of molar and temporal bones removed at operation. Next day the patient was found reading the paper, but died on the fifth day.

Case VI.—Entry wound about size of florin about three inches above left external auditory meatus, and exit wound larger over posterior border of right parietal bone. Patient delirious and talkative, no paralysis, double Babinski's sign. Wound septic; died four days after operation.

Case VII.—Two bullet wounds over left parietal and occipital bones, about 1½ inches apart, and both small. Developed signs of compression. Decompression performed; opening later enlarged, and hernia size of large orange developed. Great discharge of cerebro-spinal fluid, but ultimate recovery. A. NINIAN BRUCE.

SOME CASES OF HEAD WOUNDS. H. H. TAYLOR, *Brit. Med.* (7) *Journ.*, 1915, Oct. 30, p. 641.

FOUR cases are recorded.

The first two cases were the result of injury to the outer table of the skull, and both showed under the X-rays depression of

the inner table. Both were trephined, the depressed fragment of inner table removed, and recovery resulted.

The third case was knocked down by a bullet wound, but not rendered unconscious. He showed continuous headache and frequent vomiting. A septic wound over the occipital bone was explored, but no injury to the skull could be detected. He recovered.

The last case was injured by shrapnel over the left motor area, and the wound was septic. He showed slow cerebration, hesitating speech, but no headache nor sickness. X-rays showed no injury to the bone. His mental condition cleared up in a week, so that it was thought to have been due to shock.

A. NINIAN BRUCE.

(8) **THE TREATMENT OF GUNSHOT WOUNDS OF THE HEAD, WITH SPECIAL REFERENCE TO APPARENTLY MINOR INJURIES.** J. E. H. ROBERTS, *Brit. Med. Journ.*, 1915, Oct. 2, p. 498.

AN analysis of 140 cases is given, with the following conclusions:—

Every scalp wound should be early operated upon, however slight. All septic tissues must be completely excised at the commencement of operation. All accessible foreign bodies must be removed from the brain. Primary suture of wounds.

A. NINIAN BRUCE.

(9) **TWO CASES OF TRAUMATIC DOUBLE HEMIANOPSIA, WITH PARTIAL RECOVERY.** C. E. H. MILNER, *Lancet*, 1915, July 24, p. 179.

BOTH cases were injured by bullet wounds in the occipital region, which was immediately followed by complete blindness, and both subsequently recovered their vision except in one direction, which was identical in each, namely, the left lower quadrant of the visual field. The chief interest of these cases is psycho-anatomical, namely, why did there exist a condition of total blindness, and why was there recovery? Two explanations are suggested. In both cases some actual damage was done to the lower part of the cuneus on the mesial surface of the right occipital lobe. The double complete hemianopsia may have been caused by hæmorrhage or blood effused along the mesial aspect of the occipital lobes, causing pressure and later becoming organised into a small clot; or it may have resulted from a profound but passing shock-effect, which made itself felt also in the opposite occipital lobe, and for the time being paralysed the function of the entire visuo-sensory apparatus.

A. NINIAN BRUCE.

ACUTE SEPTIC MENINGITIS DUE TO *B. COLI* FOLLOWING
(10) **SKULL WOUND.** C. E. H. MILNER, *Brit. Med. Journ.*, 1915, Aug. 14, p. 254.

AN officer sustained a compound fracture of the right parietal bone from shrapnel. He was trephined three days later, fragments of broken bone were elevated and removed, the original skull wound was opened and enlarged, and the dura opened and drained. He recovered and was sent to England, where he developed violent headache, and a temperature of 103° F. Kernig's sign was negative, and there was no rigidity of the neck. Lumbar puncture gave issue to a fluid under slightly increased pressure. There were 3,760 cells per cubic mm., of which 70 per cent. were polymorphs. A pure culture of *B. coli* was isolated, from which a vaccine was prepared, and later administered. Complete recovery resulted.

A. NINIAN BRUCE.

CASE OF SHRAPNEL INJURY TO RIGHT PARIETAL CORTEX
(11) **(showing paresis of left lower extremity, together with cortical sensory loss and thalamic over-response).** H. M. ANDERSON and H. L. C. NOEL, *Lancet*, 1916, Jan. 8, p. 79.

A SOLDIER was hit on the head by shrapnel and was unconscious ten minutes. Since then he complained of headache and numbness of his left leg. The X-ray showed two pieces of metal in the outer table of the skull in the parietal region, with a depressed fracture below. The right leg was normal. The left leg was weak, ankle clonus was just obtained, the plantar reflex was extensor, and the abdominal reflex was abolished. The whole leg showed over-action to pin-prick, the line of demarcation being definite. Localisation was accurate. Spontaneous movements of an irregular and jerky character occurred from time to time, or could be elicited by any painful stimulus, or by gently stroking the limb with cotton-wool. Stimulation of the sole gave a feeling like an electric current passing through the leg. Complete return to the normal followed operation.

Two definite sensory changes have to be distinguished: (*a*) Loss of posture, inability to distinguish compass points, &c. These are due to local pressure to the post-Rolandic cortex. (*b*) The over-action to stimulation, however, is of thalamic origin, and is explained by the removal of the inhibitory influence which the cortex normally exerts over the thalamus. The involuntary movements were of reflex origin, and probably represent the efferent expression of the thalamic level. Why thalamic over-response has not been more frequent in cortical sensory lesions in the war is uncertain, but in this case the amount of brain damage was small and the shock slight. A. NINIAN BRUCE.

BULLET WOUND OF LEFT POSTERIOR CENTRAL CONVOLUTION. A. PANSKY, *Nouv. méd. de Minsk*, 1915, Nos. 1-2.
(12)

A CASE of fracture of the left parietal bone, with a portion of the internal plate driven into the brain. The symptoms were right hemiparesis, diminution of sensibility on the right side, positive Babinski's sign, and partial astereognosis. A. NINIAN BRUCE.

TRAUMATIC LESION OF THE RIGHT FRONTAL LOBE. TOMMASO LUCHERINI, *Il Policlinico*, 1914, Nov. 22, p. 1633.
(13)

A CASE of fracture of the skull which was trephined. There was a cerebral hernia and loss of much brain tissue. No mental symptoms were present. The author considers that this case does not support the view that the frontal lobes have a psychical function. A. NINIAN BRUCE.

SPINAL CORD.

SPINAL INJURIES OF WARFARE. GORDON HOLMES, *Brit. Med. Journ.*, 1915, Nov. 27, Dec. 4, and Dec. 11, pp. 769, 815, and 855.
(14)

THESE three papers form the Goulstonian Lectures for the year 1915.

Lecture I. *The Pathology of Acute Spinal Injuries.*—The following conclusions were drawn:—

1. The structural lesions in the spinal injuries of warfare are rarely sharply limited or circumscribed, and cannot be compared to those produced experimentally in a physiological laboratory. The level of the lesion, as indicated by the clinical symptoms, for instance, often does not correspond with the level of maximal damage.

2. The lesions are so irregular in distribution and severity when the spinal injury is not complete, that much care is necessary in drawing conclusions from the clinical symptoms alone on the functions of parts which it may be assumed have been involved.

3. Secondary changes may occur later in the cord which can alter or modify the clinical symptoms.

One of the most interesting changes is the occurrence in more than half the cases of cylindrical cavities in the segments of the spinal cord above or below the lesion. These may extend over four or five segments; with one exception they were always situated in the dorsal columns, and did not involve the grey matter or approach the central canal. Their contents are degenerating

fibres and disintegrated neuroglia. There can be no doubt the contents during life existed under pressure. They become larger away from the lesion, and end in a rounded apex, the other end rarely extending down to the primary lesion. Their origin is obscure, but they are not due to infection, hæmorrhage, or to any vascular lesion, in fact their situation is at the watershed of two main groups of vessels, and thus at an area where the blood supply is poor.

The microscopic changes in the cord are described in considerable detail. Among other points it is noted that the evidence from this source is in favour of a neuroglia origin for the compound granular corpuscles.

Lecture II. *The Clinical Symptoms of Gunshot Injuries of the Spine.*—Over 300 cases were observed.

The segmental level of the lesion can be usually recognised as accurately by the extent of the motor paralysis as by the upper border of the sensory disturbance. In incomplete lesions, especially if unilateral, an exact diagnosis may not be always possible from even an accurate sensory chart, on account of the oblique course of the decussating sensory fibres in the cord. In lesions of the dorsal columns the disturbance in the appreciation of vibration is valuable, as it is not recognised below the corresponding segmental area. The view that in total transverse lesions of the cord the reflexes are permanently abolished was confirmed. In less severe injuries the knee jerks return within two or three weeks. The reason of this absence appears to be due to "spinal shock," *i.e.*, the sudden severance of a portion of the cord from the influence of more orally situated centres. Spinal shock exhibits itself only in segments distal to the lesion. The reflex overactivity of isolated segments, however, may show itself in "automatic movements." An incomplete lesion of the cervical enlargement may seriously paralyse the arms and leave the power of movement in the lower limbs unaffected. Lesions of certain regions of the cord also produce special local symptoms, *e.g.*, unilateral paralysis of the diaphragm, &c. Lesions from the second cervical to the second dorsal may produce disturbance in the function of the cervical sympathetic, miosis, ptosis, &c. Injury to the lower part of the cervical enlargement was characterised by subnormal temperature, slow pulse, low blood-pressure, scanty secretion of urine, and stupor or mental lethargy. The temperature may be as low as 78·8° F., and the pulse 22 per minute. All the ten patients in whom these symptoms occurred died within eight days after the injury. The condition strongly resembles that of an animal in hibernation, and these patients do react to some extent as cold-blooded animals. Lesions of the

upper cervical segments were also sometimes associated with hyperpyrexia, *e.g.*, in one case the temperature rose to 104° F., and fell to normal without any signs of illness or discomfort, and without any apparent cause. Lesions of the mid-dorsal region were associated sometimes with persistent vomiting, so serious as to threaten life, possibly due to irritation or disturbance of the fibres of the sympathetic outflow to the stomach. Herpes was present in nine cases either above or at the upper margin of the sensory loss.

Lecture III. *The Sensory Disturbances in Spinal Injuries.*—Brief mention is first made of some of the earlier work on this subject, with the conclusions that impressions of pain and temperature pass through the opposite lateral column, the "muscle sense" through the homolateral dorsal column, while both paths are open to touch. Two cases of unilateral injury exhibiting Brown-Séquard's syndrome are described in some detail, the first at the level of the fifth cervical segment and the other at the fifth dorsal. The rest of the paper deals with remote sensory disturbances, local sensory disturbances, and subjective sensory symptoms, and closes with remarks on prognosis and treatment. In the mid-dorsal region the crossing of pain and thermal impulses apparently occurs quickly, and is probably complete in about one segment. In the upper dorsal segments two segments are required, while higher up still in the fourth cervical segment the decussation of pain impulses is not complete till five or six segments after their entry through the dorsal roots, and thermal impressions for four to five segments. Various peculiar dissociations of sensation were to be explained as the result of incomplete lesions of the dorsal columns of the cord. The occurrence of pain below the level of the injury may be due to irritation of the posterior roots in the neighbourhood of the wound, but in some cases this was found not to be the case at the autopsy, and that the pain was really due to œdema, circulatory disturbances, &c., within the cord itself.

A. NINIAN BRUCE.

(15) **THE SYNDROME OF LESIONS OF THE CAUDA EQUINA FROM GUNSHOT WOUNDS. (Le syndrome des lésions de la queue-de-cheval par projéctile de guerre.)** CLAUDE and PORAK, *L'Encéphale*, 1915, Dec., p. 105.

FROM an examination of seventeen cases, the writers distinguish three groups of cases. 1. Prolonged paralysis of both lower extremities (7 out of 17). 2. Flaccid paraplegia of both legs, with subsequent unilateral improvement (5 out of 17). 3. Unilateral paralysis from the commencement (5 out of 17).

Amyotrophy is usually early and rapid. The condition of the deep and cutaneous reflexes is very variable, and every sort of combination seems to occur. As a rule, anæsthesia is less marked and less extensive than the motor impairment. Violent pains and paræsthesiæ in the distribution of the sciatics are far from infrequent.

Urinary troubles often show dissociation, *i.e.*, bladder motility or sensibility may be either preserved or lost. Retention may occur in the absence of any sensory defect. The writers have remarked several cases in which the patient can empty the bladder voluntarily when he is at rest, but when he rises or sits down involuntary micturition takes place. Rectal defects show no parallelism to urinary defects. Genital function is usually abolished. Trophic disturbances were present only in four cases of the series.

On the whole, the prognosis is not unfavourable, and in any case seems to be better than in the diseases of civilian life that attack the cauda equina. As a result of the gradual absorption of hæmorrhagic effusions, a striking degree of improvement may take place even in cases that have appeared hopeless. The authors are averse to any surgical intervention in the majority of instances. S. A. K. WILSON.

NERVES.

FRENCH NEUROPSYCHOPATHOLOGY DURING A YEAR OF
(16) **WAR (AUGUST 1914—AUGUST 1915). (La neuropsychopathologie française pendant une année de guerre.)** G. DENY, *L'Encéphale*, Dec. 15, p. 153.

IN this first of a promised series of papers, Dr Deny, of the Salpêtrière, devotes the whole of the article to a review of lesions of the peripheral nerves in warfare. It is one of the best reviews that has been published, and in a bibliography no fewer than forty papers (of dates 1914-15) on the peripheral nerves are recorded.

The writer thinks peripheral nerve cases may be suitably classed in three groups: (1) complete section or *interruption*; (2) incomplete section or *compression*; (3) *irritation*. Combinations of these occur.

The symptoms of (1) are: complete paralysis and atony in the muscles concerned, and absence of pain on pressing these muscles; absence of hyperæsthesia and paræsthesia in the cor-

responding cutaneous distribution; absence of pain on pressing the nerve trunk; exactness and fixity of the objective sensory loss in the corresponding skin area; vasomotor and trophic changes only slight.

(2) In seven cases the symptoms are as in (1), except that there is pain on pressing the nerve and muscles; in milder cases, with complete paralysis, there is nevertheless some conservation of muscular tonicity, and varying subjective pains.

(3) Absence of paralysis, anæsthesia, or hyperæsthesia; notable hyperæsthesia, sometimes severe and agonising pains (causalgia), often muscular, cutaneous, osseous, and articular trophic disturbances.

Dr Deny proceeds to amplify these generalisations, and to discuss prognosis and treatment. The paper is worthy of study by all neurologists concerned with military cases.

S. A. K. WILSON.

NEUROPATHOLOGY OF WAR: WOUNDS OF THE PERIPHERAL NERVES. (Neuropatologia di guerra. Le ferite dei nervi periferici.) (17) G. CATÒLA, *Riv. di Patol. nerv. e ment.*, 1915, xx., p. 533.

A CRITICAL review, with a bibliography of recent French and German literature.

J. D. ROLLESTON.

NERVE SUTURE FOR BULLET WOUNDS. (18) R. ATKINSON STONEY and H. MEADE, *Brit. Med. Journ.*, 1915, July 3, p. 10.

THE function of a nerve may be interrupted without material injury, in which case the loss of function is only partial, and returns early, probably always within a fortnight or three weeks. When a nerve is partially or wholly divided loss of function is marked and permanent, and may even tend to increase. In these cases it is useless to expect spontaneous regeneration owing to the distortion and separation of the cut ends, and the great development of dense fibrous tissue which appears to follow in all cases. When a nerve is divided, the sooner an operation for its suture is performed the easier it is, and the greater the likelihood of an early cure. In cases, however, where the wound is septic, it may be advisable to allow time for the wound to heal. Even when nothing has been done for several months, there is still a chance of a successful result if late suturing is undertaken, so that no case need be looked upon as necessarily hopeless.

A. NINIAN BRUCE.

EXPERIENCES IN THE OPERATIVE TREATMENT OF GUNSHOT
(19) **INJURIES OF NERVES.** Sir FREDERICK EVE and R. S. WOODS, *Lancet*, 1915, Nov. 6, p. 1021.

TWENTY-EIGHT cases were operated upon, of which twenty-one were due to bullet and six to shrapnel or shell wounds; five were injuries of the brachial plexus, eight of the musculo-spiral nerve, one of the posterior interosseous nerve, five of the ulnar, two of the median and ulnar nerves together, and seven of the sciatic or external and internal popliteal nerves. In six cases the injured nerves were completely divided. Except for four cases, more than three months had elapsed since the time of injury. In the absence of evidence of improvement, and if the electrical reactions indicate a severe injury to the nerve, an operation should be performed as soon as the wound is aseptic. The chief point in the operative treatment is to determine whether simply to separate the injured nerve from the surrounding tissues or to resect it. There may be evidence of complete division, with union by a band of fibrous tissue, and in this case an enlargement of the proximal end will be present. Or the site of division, which may be partial or complete, is indicated only by a well-defined bulbous enlargement. In less severe injuries there is often a fusiform thickening involving the nerve trunk. In other cases, especially in injuries to the musculo-spinal nerve associated with fractures of the humerus, the nerve may be embedded in callus or stretched round a spicule of bone. Not infrequently the nerve is constricted by cicatricial tissue, or by pressure of a dense cicatrix of the integuments.

Excluding the five injuries to the brachial plexus, in eight out of the remaining twenty-three it was thought necessary to resect the damaged portion of the nerve or to refresh the ends if separated. In other cases the nerve was separated from adhesions and surrounded with Cargile's membrane. When resection was performed the fibrotic tissue or bulbous end was removed on the proximal side until the section showed well-defined nerve bundles, and the distal end was refreshed. The two ends were freed and sutured.

All cases were tested electrically by the Lewis Jones condenser, as it gave a numerical equivalent indicating the degree of interruption to conduction through the nerve and the condition of the muscle. Illustrative cases are given.

A. NINIAN BRUCE.

GUNSHOT INJURIES OF THE PERIPHERAL NERVES. WILFRED
(20) HARRIS, *Lancet*, 1915, Nov. 13, p. 1073 (29 figs.).

THE author emphasises the following points:—

1. The importance of an accurate history of the details of the wound or wounds, and of the immediate effects.

2. A careful and methodical examination of the paralysis, both motor and sensory, is necessary to determine whether it matches with the known anatomical distribution of one or more nerves, or of a portion of a plexus, or whether it resembles the phenomenon produced in hysteria.

3. Careful charts of the sensory loss are more important than the presence of complete muscular paralysis, with reaction of degeneration, in estimating the severity of the injury of a mixed nerve.

4. The various stimuli used in testing by hard or light pressure, pin-prick, scratch, camel-hair brush, or cotton-wool, are tests of different degrees of conductivity of the nerve, not of different systems of fibres. Hard pressure will still be perceived except in total interruption of the nerve conductivity by actual division or by its inclusion in dense scar.

5. Commencing recovery of sensation may in some cases be observed within a few days only of secondary suture of the nerve. Variations, however, in the sensibility must be allowed for, as this may vary from day to day within narrow limits, or according as the limb is warm or cold. A. NINIAN BRUCE.

GUNSHOT INJURIES TO PERIPHERAL NERVES. R. H. JOCELYN
(21) SWAN, *Lancet*, 1915, Nov. 13, p. 1081.

THE author has seen sixty-three cases of gunshot injuries to peripheral nerves during the last thirteen months. Of these thirty-eight were operated upon. In the examination of *recent* gunshot wounds of a limb it is quite common to find no voluntary movement, with total anæsthesia of the whole limb, and it may be some days before movement and sensation return. These cases of transient inhibition of nerve function have been called "nerve concussion," and imply a physiological block to nerve conduction rather than an anatomical lesion. All cases of nerve concussion show a faradaic response in the paralysed muscle, and such a response within ten days of the injury denotes an early return to normal function.

No operation upon a damaged nerve should be undertaken until the wound made by the missile is firmly healed and the tissues free from all underlying sepsis. The diagnosis of actual anatomical injury to a nerve will depend upon the persistence of the loss of nerve impulses, both motor and sensory, and upon the

reactions of the muscles supplied by that nerve to electrical currents. An absent reaction to faradism in a muscle is evidence of nerve injury. Occasionally in gunshot injuries to a peripheral nerve there is marked hyperæsthesia in the cutaneous area of distribution of the nerve, the significance of which is uncertain. Unless the symptoms point to a partial injury to the nerve there is no point to distinguish between complete nerve division and involvement in dense scar tissue, but as operation is required in either case, the exact nature of the lesion is not so very important. In cases of complete division the ends must be dissected free, the bulbous proximal end removed until nerve bundles can be seen, a small part of the distal end resected, and the two ends accurately joined. In cases in which the nerve is firmly involved in scar tissue, and which on dissection is found to be very dense and thickened, it is best to resect the fibrous portion and join the two ends by accurate suture. As soon as the operation incision is healed, careful treatment by massage and electrical stimulation to the muscles must be begun, as well as passive movements to prevent contractures. Suitable splints to prevent overstretching of muscles is very important. Voluntary movement may return in previously paralysed muscles some weeks before any reaction can be obtained to strong faradaic stimulation.

A. NINIAN BRUCE.

ON THE USE OF A SLEEVE OF VEIN IN NERVE SUTURE.
(22) ANDREW FULLERTON, *Brit. Med. Journ.*, 1915, Aug. 28, p. 321.

WHEN secondary suture of nerves is required, it is essential that the junctions should be protected so as to avoid ingrowing of scar tissue between the nerve ends, and consequent failure of the operation. For this the author recommends that a piece of vein from 1½ to 2 inches long be excised. One end of the nerve is then pulled through this and sutured to the other nerve-end with fine catgut. The sleeve is then pulled over the junction and fastened to the nerve sheath by a few points of suture. The vein thus forms an aseptic sheath for the nerve, keeping the ends in secure apposition: it directs the growth of the new axis cylinders, and prevents the ingrowth of scar tissue from outside.

A. NINIAN BRUCE.

NEUROSES, &c.

LOSS OF PERSONALITY FROM "SHELL SHOCK." ANTHONY
(23) FEILING, *Lancet*, 1915, July 10, p. 63.

THE case is described of a bandsman, aged 24, who was buried in a trench at Ypres. He seems to have been dug out twelve hours later, was unconscious for twenty-four hours, and deaf and dumb

for three days. He then did not know his father or relatives, and his mind was found to be a complete blank to all events previous to his being buried. He was "regarded as a case of loss of memory, or amnesia of such a degree that all conscious memories of his life, as well as the countless memories forming his knowledge of letters, objects, and life in general, were completely suppressed." He was thus a case of complete dissociation, or obliteration, of personality, the term "double personality" being hardly applicable. He was happy and contented on the whole, but could remember nothing previous to his injury. When taken to the Zoo, he tried to stroke one of the lions, had no interest in the war, but was interested in music. He was hypnotised, and it was suggested to him that his lost memory would gradually return on awakening. This had no effect. At the second sitting he answered all questions of his past life freely, and it was possible to reconstruct his whole story. He thus presented two personalities. No. 1, *i.e.*, during ordinary life in hospital, was his personality since the date of his "coming to himself" in a hospital in Manchester. No. 2, *i.e.*, the state during hypnosis, was his old personality endowed with all the memories of his past life, and with the more recent and lively memories of experiences on active service in Flanders, up to the time of the burial in the trench. Persons seen and known to him in his ordinary state were always complete strangers to him in his hypnotic state, and *vice versa*. In his ordinary state he took no great interest in his father, under hypnosis he regarded him with great affection.

About twenty-five sittings were held, but no improvement resulted, and as a certain amount of psychical disturbance seemed to be caused, further hypnotic treatment was abandoned. He was sent home, but his condition remained unaltered. He had no recollection of his previous life at home, and failed to recognise old friends. A. NINIAN BRUCE.

FUNCTIONAL NERVE DISEASE AND THE SHOCK OF BATTLE.

(24) **A study of the so-called traumatic neuroses arising in connection with the war.** DAVID FORSYTH, *Lancet*, 1915, Dec. 25, p. 1399.

ERICHSEN in 1875 first recognised the nervous effects of intense emotional strain involving the risk of death. This he thought was "dependent on molecular changes in the cord itself," but which was refuted by H. W. Page in 1883. The term "spinal concussion" was slow to be discarded, although Dana in 1884 claimed that these were really instances of traumatic neurasthenia, hysteria, and hypochondria, and it was only after Oppenheim's monograph in 1889 that the term "traumatic neurosis" became at all general. This he described as a neurosis specifically caused

by injury and distinct from traumatic neurasthenia and traumatic hysteria. Bailey in 1908 summed up the modern view as follows: "The theory of a special traumatic neurosis lacks clinical foundation and has been generally abandoned."

The war has produced a unique opportunity to study these cases, especially as they are not influenced by the making out of a case for legal damages, nor to be suspected of cherishing their symptoms to nourish a grievance against the enemy at whose hands they have suffered. These cases are sent home from the front with a diagnosis of neurasthenia and may be classified according to the gravity of the symptoms, which, however, are hardly ever the same twice over. The commonest signs are a harassed, worried expression, obviously shaken nerves, physical exhaustion, bad sleep, vivid dreams, are emotional, depressed or irritable, with poor memory, lack of concentration and attention, headache, and may be deaf, blind, stutter or be paralysed in one limb. Others are tired and depressed, content to lie in bed, want no visitors nor books, hands tremulous, memory bad, with headache, insomnia and dreams. This condition is perhaps best described as "nervous exhaustion." Others complain of local sensory or motor disturbances and are emotional, irritable, crying when spoken to, resist all mental help, refuse to stay in bed, and protest that little is the matter with them. This is the neurotic type and blends with the above in all degrees. The symptoms are always referable to the strain of active service. Sniping is important, the ghastly sights of carnage are still more responsible, but the intensest strain is high explosive shell fire, with the speculation of how near the shell will burst and how long it will be before he is blown to pieces.

Strain, however, is not the only causal factor, because the same strain has different effects on different individuals. Attention must thus be directed to the temperament and personal psychology of each patient.

At the time of the trauma, the psychical importance of the situation arises from the fact that it involves the risk of death. Against this the instinct of self-preservation rebels, employing as its weapon the powerful emotion of fear, which is a natural emotion and therefore ineradicable. Its function, like pain, is protective, dictating immediate flight, and can be coerced only by a still more powerful effort of will. Each new conflict of this nature is successful only at an increased cost of nervous energy, until the time comes when the individual can no longer hide from himself that he is afraid. He now goes in constant anxiety that others will find it out, and it is not now necessary for high explosive shells to cause him to lose his self-control. Once the breakdown has occurred the symptoms vary according to the pre-

existing psychopathic tendencies of the patient, with which the war often has nothing to do.

The only treatment during the acuter stages comprises three items: (*a*) physical rest in bed; (*b*) mental quiet; and (*c*) good food. Isolation is best, and all noise should be removed. Once the acute stage is past several of the symptoms, *e.g.*, depression, listlessness, taciturnity, lack of confidence, &c., are traceable to the patient's self-criticism of his behaviour under fire, and are quickly relieved by getting him to talk freely, and explaining the facts to him in their true light. If further treatment is required, psychoanalysis is necessary, and the problem now becomes an everyday neuroses, the incidents of the war merely being the most recent in a life-time of mental strains. The percentage of cases requiring this is probably less than five. "With an increasing experience of these cases a very strong doubt rises as to the judiciousness of sending any cases of nerve-shock, with few exceptions, back to the firing line" on account of "the marked deterioration, sometimes amounting to a total loss, of the fighting value of men who, after being shaken in nerves, have been compelled to return to the trenches." If this anxiety be removed, recovery is always speedier. A. NINIAN BRUCE.

THE PSYCHOLOGY OF TRAUMATIC AMBLYOPIA FOLLOWING
(25) **EXPLOSION OF SHELLS.** J. HERBERT PARSONS, *Proc. Roy. Soc. Med.*, 1915, viii., April (Neurol. Sect.), p. 55 ; *Lancet*, 1915, April 3, p. 697.

IN the cases under consideration we are dealing with individuals of various moral and psychological character, disposition, and temperament. Their temperaments are determined chiefly by the condition of their visceral organs and circulation. Their dispositions are determined by the sum total of the conative impulses of certain primitive instincts, which vary within relatively narrow limits in their innate characteristics and relative strengths, and are subject to acquired modifications in accordance with the environment of the individual. Their characters are determined by their temperaments and modified innate dispositions, of which the latter are subject to a volitional control which varies according to their social environment and educative experience.

Afferent sensory impulses, modified by afferent visceral impulses, and by other more subtle impulses due to previous experience, lose to a large extent their specific characters, and become merged in a complex cognitive impulse. Even from this the mind springs forward to the emotional state which is thus aroused, and becomes concentrated on the efferent conation. Consciousness is focussed on the appointed end; all else is

relegated to a subconscious background. The effect of an intense emotional shock on this highly complex system may, *a priori*, be expected to be manifold and complex.

The effects of a blinding flash of light will be to produce certain definite reflex effects, closure of the eyes, recoil of the body, &c. But these sudden and unexpected visual sensations play an important part in the sensational complex which gives rise to the emotion of fear. This is still more powerfully aroused if the blinding flash is accompanied by a great noise and an offensive smell. A soldier under shell fire is usually bodily fatigued, whereby his control is impaired. He has "the fear of death before his eyes," and is in a state of acute excitement, whereby his normal judgment is impaired. These conditions conspire to give his innate instincts ungoverned play. On the other hand, positive self-feeling, aided by suggestion and imitation, patriotism, honour of the regiment, &c., enforce his volitional control. At last the shock comes which strikes him unconscious, or rather "subconscious," and hence the more a victim of his lower instincts. This "unconsciousness" is to be explained physiologically as an abrogation of the functions of the highest level cortical cells. Recovery shows they are not damaged, and it is likely that the block occurs on the afferent path at the synapses of these cortical cells. Consciousness returns, but there is blindness. The lower visual paths are intact and function normally. The condition resembles uræmic amaurosis.

The early loss of vision has thus a definite neural basis; in the later stages the neural basis is of that undefined nature that we associate with so-called "functional" conditions. In other words it is neurotic, but it is not "shamming." In the earliest stage of recovered consciousness volitional control is almost, or quite, abrogated, and there can be little doubt that the most potent of the primeval instincts—fear—holds almost undisputed sway. As recovery progresses, this becomes masked or suppressed, as the self-regarding sentiment gradually becomes restored.

This paper should be read in the original. It is followed by a discussion. A. NINIAN BRUCE.

THE PSYCHOLOGY OF TRAUMATIC AMBLYOPIA FOLLOWING
(26) **THE EXPLOSION OF SHELLS.** HUGH S. PEMBERTON, *Lancet*, 1915, May 8, p. 967.

A CASE in an artillery sergeant in which the following factors were present: (1) Excitement during a prolonged and critical attack. (2) Over-stimulation of eyes and ears. The flashes of night firing are very brilliant, while many batteries close together and all firing rapidly invariably produce temporary

deafness among the gunners. (3) Some natural fear from close hostile bursts. (4) Disgust at the sight of the killed, two of whom were decapitated and one disembowelled. (5) Great physical and mental fatigue from continuous laying of the gun during twelve hours. A. NINIAN BRUCE.

THE TREATMENT OF "CONCUSSION BLINDNESS." ARTHUR F. (27) HERTZ and ARTHUR W. ORMOND, *Lancet*, 1916, Jan. 1, p. 15.

USUALLY these cases have been rendered unconscious by an explosion in their immediate vicinity, and on regaining consciousness are unable to see. They are undoubtedly psychically blind, and maintain this condition indefinitely. They can be easily distinguished from malingerers.

The treatment here recommended is to take the men singly into a darkened room, and to tell them to relax their minds so that it becomes, as far as possible, a blank. When light hypnosis was induced, the patient was subjected to "a forcible suggestion from the operator, who reiterates the patient's ability to see and to open his eyes, and to assert very vehemently that he is not blind as he imagines, but that his eyes are perfectly sound, and that he *can* see." Seven cases are recorded. One very resistant case was given an anæsthetic, and suggestion was tried during the stage of semi-consciousness with marked success.

A. NINIAN BRUCE.

THREE CASES OF CONCUSSION APHASIA: TREATMENT BY (28) **GENERAL ANÆSTHESIA.** A. P. PROCTER, *Lancet*, 1915, Oct. 30, p. 977.

THE first case was allowed out of hospital with some of his companions, and while in a village became intoxicated. In this condition he "found his voice," and for two days talked and sang incessantly. He was discharged cured.

The other two cases were cured by light ether anæsthesia, the patients being induced to speak during the period of excitement.

A. NINIAN BRUCE.

TWO CASES OF FUNCTIONAL APHONIA (ONE INCLUDING (29) **FUNCTIONAL DEAFNESS) FOLLOWING THE BURSTING OF A SHELL IN CLOSE PROXIMITY TO THE PATIENT.** HERBERT TILLEY, *Proc. Roy. Soc. Med.*, 1915, viii., June (Laryngol. Sect.), p. 115.

THE first case recovered after a moderate intralaryngeal faradaic shock. In the second even a strong faradaic shock would not restore phonation, and as he refused to open his mouth, the

laryngeal electrode was passed through the left nasal cavity into the larynx, and the current passed until the resulting spasm induced marked cyanosis. On the removal of the electrode the patient's voice returned and he spoke for the first time for three months. The hearing also was restored at the same time.

A. NINIAN BRUCE.

FUNCTIONAL APHONIA. J. F. O'MALLEY, *Proc. Roy. Soc. Med.*, (30) 1915, vii., June (Laryngol. Sect.), p. 116.

FOUR out of six cases recovered speech on being asked to phonate with the laryngeal mirror *in situ* for the purpose of examination, and a mild application of the faradaic current was effective for the other two. A. NINIAN BRUCE.

PARESIS AND INVOLUNTARY MOVEMENTS FOLLOWING CONCUSSION CAUSED BY A HIGH EXPLOSIVE SHELL.
(31) ARTHUR HERTZ, *Proc. Roy. Soc. Med.*, 1915, viii., June (Neurol. Sect.), p. 83.

A SOLDIER, aged 29, was knocked over by the explosion of a high explosive shell, and remained unconscious for two days. On regaining consciousness he could not move his right arm or left leg. Power in both limbs soon returned to some extent, but as soon as he tried to stand, violent involuntary movements occurred in his left leg. When he clenched his left hand an associated movement occurred in the right hand, but not *vice versa*. The plantar reflex was flexor, but Babinski's second sign, combined flexion of the thigh and pelvis, was positive. Suggestion produced no improvement, and etherisation had the effect of hypnotising the patient, so possibly the symptoms, although unusual, were organic in origin. A. NINIAN BRUCE.

"FROST-BITE."

SO-CALLED FROST-BITE OF THE FEET. (Contribution à l'étude des soi-disant faits de gelure des pieds.)
(32) L. A. LONGIN, *Annales de Dermatol. et de Syphiligraphie*, 1915, v., Octobre, p. 595 (4 figs.).

THE author has observed many severe cases of so-called frost-bite. He points out that the trouble has been caused at a temperature above freezing point, that the classical symptoms of frost-bite are absent, and that the condition is really a syndrome of *asphyxia and gangrene of the extremities.*

Three stages in the condition are to be distinguished:—

First: *œdema*, or rather "succulence," not pitting much on pressure, and of a whitish colour.

Second: *œdema with blisters or separation of the epidermis.*

Third: *gangrene*, either in small superficial patches or completely involving part of the foot.

Four clinical types can be recognised:—

1. A general œdema extending as far up as the level of the malleoli, and appearing to involve the complete thickness of the foot, and not only the subcutaneous cellular tissue.

2. Œdema with blisters. The œdema is now tight, stretching the skin, which glistens. The blisters may contain serum alone, or if deep, also blood. In places where the thickness of the skin does not allow blisters to form, a general detachment of the skin is found.

3. Œdema with blisters and with isolated patches of gangrene at places where there has either been pressure or friction. These are often superficial cutaneous ulcers.

4. Gangrene involving different portions of the foot, often the great and small toes. Three varieties are found—(*a*) all the toes are involved, the line of demarcation being the root of the toes both on the dorsal and plantar aspects; (*b*) the dorsal surface is affected as far as the roots of the metatarsals and the plantar surface for the anterior two-thirds; (*c*) the whole of the plantar surface is involved, plus the deeper tissues, so that preservation of the foot is impossible, and (*d*) complete gangrene as high as the malleoli. The symptomatology is described. The only serious complication is tetanus. The author lost two cases from this, while a third case, who had previously received an injection of anti-tetanic serum, recovered after a week's illness. He recommends the use of this serum in all cases with gangrene or wounds.

It is a condition which affects young soldiers of poor constitution, who develop, from the constant fatigue and uninterrupted strain upon the nervous system, a swelling of the feet; this is aided by compression from bandages, &c. The boots become soaked and further constrict the foot. All these factors are acting for several days, and produce a reflex angiospasm, the resulting ischæmia being further increased by the feebler cardiac action from fatigue. The duration and extent of this arterial spasm determines the severity of the symptoms.

Treatment is discussed at some length, special attention being directed to the value of hot air. Preventive treatment is also referred to, and the necessity of every form of constriction to the feet being removed is emphasised. A. NINIAN BRUCE.

FROST-BITE. E. G. FEARNSIDES, *Brit. Journ. Dermat.*, 1915, (33) Feb.

IN considering the effects of cold, two distinct periods have to be clearly separated—a period during which the cold is still active, and primary disturbances predominate; and a second during which we are dealing with purely secondary effects. The cases studied by the author fall into this latter group, for they have been seen in this country only, and several days after the onset.

In addition to the degree of cold, other important factors are the duration of the exposure, the nature of the surrounding medium, whether conductor or non-conductor of heat, the general health of the patient, his nutrition, mental state, and muscular activity.

The local changes occurring in "frost-bite" have been divided by Marchand into two groups: (1) changes due to the actual freezing of soft parts; (2) changes due to alterations in the vascular supply of the affected parts.

Cases belonging to the first group are very rare, but cases belonging to the second group are relatively common, and may be produced by exposure to cold well above the freezing point, gangrene of the whole of the distal portion of an extremity, or of one or more toes or fingers occurring. All the author's cases of "frost-bite gangrene" belong to this category; the temperature of the mud in which their feet were embedded had never fallen sufficiently low to allow of the actual freezing of superficial tissues. It is to this second group also that all the author's cases showing objective manifestations on their arrival in this country have belonged. The condition comes on gradually, usually affects symmetrical parts of the feet, is accompanied during exposure to feelings of stiffness, coldness, itching, numbness, and loss of sensibility in the distal portions of the feet. In the cases of gangrene seen by the author, the feet alone were affected, and not one of these had removed his boots and puttees for seventy-two hours, and several not for periods up to fourteen days. The hypothesis advanced in regard to this type of "frost-bite" is that it is due to changes in the lumina and walls of the blood vessels and lymphatics. Predisposing and aiding factors are a prolonged dependent posture of the feet, the absence of the normal periodic contractions of the muscles, tight boots, lack of sleep, the excessive use of bad tobacco, this last paralysing the nerve endings of the vasomotor nerves.

The objective manifestations may be in the nature of congestion, chilblains, œdema, blisters, hæmorrhages, hæmorrhagic blisters, pigmentation, desquamation, or gangrene. Besides these, the extensor tendons to the toes and the tendons of the peronei and

tibiales muscles are often taut, with the consequence that the great toe is dorsi-flexed, the other toes hyper-extended, and the whole foot grossly everted or inverted. These cases should be treated by elevation of the limbs, massage, movement, simple dusting powders, or painted with 2 per cent. solution of iodine in spirit.

In another group of cases studied, few objective changes have been present, and yet the patient has had many subjective complaints, and has shown either hyperæsthesia, hypæsthesia, or anæsthesia. The author is inclined to view the cases in this last group as suffering from a functional neurosis, and isolation, massage, and encouragement are looked upon as the essential means of treatment. The prophylactic measures adopted by the Royal Army Medical Service are also mentioned.

D. K. HENDERSON.

ON THE PREVENTION OF "FROST-BITE" AND OTHER EFFECTS
(34) **OF COLD ("Froidure" or "Frigorism").** S. DELÉPINE, *Journ. Roy. Army Med. Corps*, 1915, May; *Lancet*, 1915, Feb. 6, p. 271.

THE author remarks on the difficulty of finding a suitable term to indicate the group of morbid states brought about by cold. He favours the use of the term "Frigorism."

The general effects of exposure to cold are not yet clearly understood, but three degrees of *Local Frigorism* have been recognised.

First Degree.—Local anæmia, usually followed by hyperæmia, tingling, itching, œdema, chilblains.

Second Degree.—The skin becomes darker, clear or blood-stained serum may accumulate, superficial ulcers and fissures may occur.

Third Degree.—Necrosis is produced, and the parts affected are dark or pale, soft or dry, and hard.

The factors influencing the effects of cold upon the body are discussed, and a contrast is especially drawn between exposure to still, dry air and exposure to water at the same temperature, to misty air, and to rushing air or water.

After a series of experiments it was found that the lowering of temperature caused by immersion in (*a*) an unlimited amount of water at a temperature below that of the skin, or (*b*) water containing ice, was very rapid, considerable, and progressive. Local frigorism, characterised by contraction of small arteries, more or less complete arrest of flow of blood, various degrees of anæmia or passive hyperæmia, irritation of terminal nerves, followed by nervous and muscular paralysis, was invariably the result. To counteract the above effects the author has manufactured thin waterproof bags capable of protecting the leg up

to the knee or hip. These bags may be worn over an inner sock and protected by a second outside sock. The adoption of them for the feet and legs of our soldiers for the purpose of preventing frost-bite has been recommended. D. K. HENDERSON.

TRENCH-FOOT OR SO-CALLED "FROST-BITE." R. H. JOCELYN (35) SWAN, *Practitioner*, 1916, xcvi., Jan., p. 46.

THE name "frost-bite" is unfortunate, as the condition is most prevalent in troops not subjected to a temperature below freezing point, it only rarely affects the hands, nose, and ears, and bears little relation to the disease of the extremities following severe frost.

It appears to be caused by constant wetness, lowered temperature, immobility of the muscles, and any factor causing constriction of the venous return. The first symptom usually noticed is numbness, with swelling of the feet and often discoloration of the skin. There may be blisters with ulceration or gangrene. There may be anæsthesia of the stocking type, or hyperæsthesia due to tissue changes caused by prolonged vasomotor constriction. They are not due to a functional neurosis. As a rule the toes cannot be moved voluntarily, or only with difficulty.

Warmth often increases the pain; leaving them exposed to a cool temperature is frequently helpful. Some remarks on preventive treatment also follow, *e.g.*, boots two sizes too large should be used, with loose laces and puttees, a loose mackintosh stocking should be worn under the puttees, and vaseline smeared over the feet. A. NINIAN BRUCE.

FROST-BITE IN THE PRESENT WAR. C. MAX PAGE, *Lancet*, 1915, (36) March 20, p. 590.

THREE hundred and thirty-two cases were observed. In only two were the hands involved as well. Frost was only present in 10 per cent. of the cases. If the feet swell while the boot is on, the skin becomes exposed to pressure, and this pressure produces the sensory changes. This is shown by the facts that (1) when the hands are involved the type of anæsthesia seen in the feet does not appear. (2) In cases of any severity the skin of the toes, being limited and tight, always becomes anæsthetic. In cases of moderate severity with anæsthesia of the dorsum of the foot, the skin under the instep often remains sensitive, it being the part of the foot least exposed to pressure from a boot. (3) If a man's foot be covered with lint or a sock, and then firmly bandaged from the toes upwards with a Martin's rubber bandage,

and so left for three or four hours, anæsthesia of the skin of the toes and neighbouring part of the dorsum of the foot sets in, and persists for a day or two.

Three types of cases can be distinguished:—

1. No signs to the naked eye, but anæsthesia of the functional type.

2. No signs beyond slight œdema, but with organic sensory changes.

3. Organic sensory changes with gross œdema and bleb formation.

Active treatment may be (*a*) curative, and (*b*) symptomatic. Of the former, counter-irritants did not affect the speed of recovery, although they relieved pain for a little. Oil of turpentine and tincture of iodine produced vesication and desquamation. Hot baths, hot fomentations, and massage expedited the appearance of hyperæsthesia. Stroking the legs and feet with electrodes through which a faradaic current was passing proved most efficacious in removing functional anæsthesia, but did not benefit organic sensory changes. A. NINIAN BRUCE.

SOME OBSERVATIONS ON 376 CASES OF "FROST-BITE." CHARLES (37) MILLER, *Lancet*, 1915, April 17, p. 801.

THREE hundred and seventy-six soldiers had been admitted to the British Red Cross Hospital, Netley, suffering from so-called "frost-bite." 100 consecutive cases were examined, and the following particulars compiled:—

1. It was freezing at the time of the "frost-bite" in 65 out of 100 cases.

2. Every man was wearing short boots with more than one pair of socks. The majority were wearing puttees.

3. Change of colour in the feet, red-blue, blue, or black, was noticed by the patient in 58 per cent. of the cases. Among these men it had been freezing in 40 cases.

4. In the remaining 42 per cent. the feet were said to be pale. Among these men it had been freezing in 25 cases.

5. In the 58 "coloured" cases the first symptom was numbness or "dead feeling" in 37, pain in 14, and painful swelling in 7.

6. In the 42 "pale" cases the first symptom was numbness in 23, pain in 9, and swelling in 10.

7. In all cases the men had been standing in mud, or mud and water, of a depth varying from 18 inches to 3½ feet, for many hours.

The "pale" feet are of a creamy-white colour, and the skin is dry and inelastic. The foot radiates heat to a distance of 2 or 3 inches, the radiation being easily perceptible by the hand. Pain

and tingling are most prominent in the "pale" feet; in the "purple" feet the colour is usually deep purple, and is most evident on the ball of the great toe and at the bases of the other toes. The discoloured area is anæsthetic, but sensation may be acute at its margins. Blisters are most common on the dorsal surface.

Local treatment consisted of (1) *Warmth.*—This was only useful where the feet were anæsthetic or nearly well. (2) *Cold.*—This is necessary in most cases. The atmospheric air is usually cool enough, and the plan used was to leave the feet uncovered and guarded by a bed cradle. (3) *Position.*—The feet were most comfortable if raised on pillows, which caused all œdema to disappear. (4) *Massage*, either dry or with some lubricant, very light at first, later vigorous with passive movements. (5) *Applications* of various oils are good.

Patients can be sent on furlough when able to walk comfortably in boots. Tetanus occurred in two cases of ulcerated "frost-bite." Both survived. Thrombosis of the saphenous vein occurred in one case. Seven cases developed enteric after arrival, and many took influenza.

It is incorrect to regard one group of these cases as "neurotic" or "functional." The differences are in the effects on different individuals, and are merely different manifestations of the same condition. "Pale" feet are never "functional." The condition is always primarily physical. A. NINIAN BRUCE.

A NOTE ON "FROST-BITE." F. M'G. LOUGHNANE, *Lancet*, 1915, April (38) 17, p. 803.

THE author records that out of 160 patients admitted to the Indian Hospital in Boulogne one evening, 120 were cases of frost-bite alone. Hill men, such as the Gurkhas, suffered equally with the Sikhs and men from warmer parts of India. He thinks it would be more correct to term the condition "boot-bite." The boots cause a vicious circle to develop as the wet leather shrinks and presses the feet, setting up traumatic inflammation and swelling, which in turn increases the pressure from the boots. In many cases a considerable degree of septic infection was present. Two cases required a Faraboeuf's amputation below the knee. Amputation should always be postponed to the very last, as long as the patient is not suffering from toxic absorption. A general gangrene may follow if frost-bitten feet are allowed too near a fire, on account of the sudden increase of fluid into the tissues, especially as sensation is absent or diminished.

A number of general remarks on preventive, active, and convalescent treatment are given. A. NINIAN BRUCE.

FROST-BITE. A. W. MAYO-ROBSON, *Lancet*, 1915, Jan. 16, (39) p. 117.

A BRIEF account of the condition. It is recommended that for threatened gangrene the whole foot should be sterilised by rubbing with oil of turpentine to cleanse the skin, or with spirit containing 1 in 500 biniodide of mercury, after which strips of sterilised double cyanide gauze should be applied between the toes, and the same gauze made to cover the whole foot, which is then enveloped in sterilised cotton-wool. Painting the foot with tr. iodine would probably be quite as effectual.

The paper closes with the following copy of the Army Routine Orders, November 23rd, 1914:—

353. *Frost-bite, Precautions Against.*

Cold is likely to give rise to frost-bite when the circulation of blood is interfered with or rendered feeble.

The feet are likely to be frost-bitten under the following circumstances:—

1. When boots and puttees are too tight.
2. When the general circulation throughout the body is less active than normal.
3. When the socks, boots, and puttees are wet.

The best precautions are on the following lines:—

1. Boots should not fit tightly, but should be at least a size too large. When large boots are worn it is well to wear two pairs of socks; but this is dangerous if the boots are small, as it leads to further pressure on the foot. Puttees should never be applied tightly.
2. The general circulation can be kept up by keeping the body warm and dry. A mackintosh sheet worn over the great-coat is of assistance where no waterproof is available.
3. A dry pair of socks should be carried in the pockets when available.

Officers should see that dry standing is provided in the trenches whenever possible by means of drainage, raising of the foot-level by fascines of brushwood, or straw with boards on top, or by the use of pumps where these are available.

A. NINIAN BRUCE.

THE TREATMENT OF PAINFUL "FROST-BITE." W. CHARLES (40) DAVIS, *Brit. Med. Journ.*, 1915, March 27, p. 545.

THE author recommends the following remedy as the best for painful frost-bite: Cocainæ, gr. viii.; ol. olivæ, ʒiv.; liq. calcis., ʒiv. This simply means carron oil and cocaine. A small quantity is rubbed into the feet twice daily with massage, and the feet are afterwards wrapped in cotton-wool. It is an improvement to add

1 oz. of liquid paraffin to 4 oz. of carron oil, so as to prevent it from oxidising and drying up too quickly. When the oil drys on the feet, the following dusted on is an excellent powder: Camphor, gr. xxxv.; zinc oxide and pulv. amyli, āā ʒ ss. Such treatment enables the patient to sleep without a narcotic. When the acute stage passes off the carron oil and cocaine is mixed with equal parts of carbolic oil, the percentage of which is increased as the pain decreases. A. NINIAN BRUCE.

THE ELECTRICAL TREATMENT OF TRENCH-FOOT AND
(41) **FROST-BITE.** W. J. TURRELL, *Practitioner*, 1916, xcvi., Jan., p. 52.

"THERE is no remedy which affords more immediate or more lasting relief to the pain than diathermy." Diathermy is a form of high frequency current of very large amperage (2 to 3 amperes) and of moderately high voltage (about 800 volts). The direction of the current is changed about a million times a second, and upon the frequency of this oscillation the safety of the treatment depends. The only effect noticed is the heat produced in the tissues, and as the sensation of the patient is the most important guide to the strength of the current, when sensation is lost only a small amount of current must be used. A marked decrease in the swelling of frost-bitten feet is usually seen after the application of this treatment. The relief from pain is due to the relaxation of spasm and the reduction of tension and pressure following the production of heat in the tissues. Six illustrative cases are described.

In treating cases in which there is considerable swelling, with numbness, ecchymosis, induration, or ulceration, the static breeze current is the most effective remedy. This current is unidirectional and of enormous voltage, but never exceeds one or two milliamperes. It removes congestion and stasis, and hence relieves pain, tingling, and numbness. It excites an active hyperæmia which stimulates the tissues and accelerates the separation of necrosed parts.

In promoting the absorption of blebs and in treating the ecchymosed surface of trench-feet, the high frequency vacuum tube is most useful.

The best treatment for old-standing numbness is the continuous galvanic current. A. NINIAN BRUCE.

ON THE PATHOLOGY OF TRENCH FROST-BITE. J. LORRAIN
(42) SMITH, JAMES RITCHIE, and JAMES DAWSON, *Lancet*, 1915, Sept. 11, p. 595; *Journ. of Path. and Bacteriol.*, 1915, xx., Oct., p. 159 (16 figs.).

FIFTY-ONE cases were examined clinically. The condition began with numbness and slight swelling, which often disappeared.

Next day the feet again became numb and felt tight. Difficulty was experienced in getting out of the trenches, the feet being paralysed, with no sensation. Pain was not prominent at first, but increased in intensity as the swelling and numbness disappeared. In slight cases there was either no discoloration or only a slight blush over the ends of the toes. In more severe cases the discoloration was greater. This is due to hæmorrhagic infiltration, and is specially observed under the nails. In cases where the skin had become hard it was separating, leaving a layer of normal skin beneath. During recovery there was sometimes a very troublesome and persistent pain, which was described as the feeling associated with recovery from "sleep" in the feet. The zone limiting the anæsthesia was usually paræsthetic.

A number of rabbits were then placed in a wide glass cylinder standing on a layer of wet earth with the hind feet well shaved. When the mud was wet and cold, swelling became marked in about two to three days. When the mud was dry, the cold had much less effect. Constriction of the limb by a band of sticking-plaster increased the tendency to œdema. The application of warm water (37° C.) to the foot after it had been exposed to the cold increased the œdema very markedly. When the animal was replaced in its cage in the animal house, the swelling rapidly disappeared. Microscopically, the chief effect of the cold was found to be on the blood vessels, which were dilated. The only changes in the nerves consisted in œdematous swelling of the axis-cylinders, and this appeared to be merely a part of the general œdema of the tissues. There was no sign of degeneration of the myelin, and the nerve cells in the cord were normal. The change appears to be due to an injury to the blood vessels, with an excessive amount of outpouring of fluid and accumulation of fibrin in the tissues. If the vessels become congested by the application of warmth, the walls rupture and blood corpuscles pass into the tissues. The changes are similar to those of the slighter stages of injury in true frost-bite.

The following practical considerations for prevention are suggested: (1) Persistent rubbing of the feet before going into the trenches. (2) As the symptoms do not begin until after forty-eight hours' exposure, the time in trenches should be correspondingly shortened. (3) The feet should be massaged twice daily between turns in the trenches. (4) Constriction by boots and puttees should be avoided. Moleskin leggings are better. Covering the feet with vaseline is to be recommended. (5) Extra clothing to the legs is advisable to maintain the circulation in the feet. (6) A medical examination should always take place after a threatened attack. (7) If it has become so severe as to disable a man he should not be allowed to walk to billets. (8) When billets

are reached the feet should not be warmed in any way that causes congestion, and the return of the normal circulation should be delayed rather than hastened. A. NINIAN BRUCE.

MENINGITIS.

REPORT ON CEREBRO-SPINAL FEVER IN THE ROYAL NAVY (August 1914 to August 1915). H. D. ROLLESTON, *Journ. Roy. Naval Med. Service*, 1915, i., p. 373; *Lancet*, 1915, Oct. 23, p. 909.
(43)

THE report contains (1) a discussion of the etiology of the disease; (2) a history of the attacks at the various centres; (3) a summary of the rarer manifestations and complications; (4) a summary of the results of treatment; (5) recommendations as to prevention of the disease and its spread.

Of 170 cases, 90, or 52·9 per cent., died. Some evidence of infection was traced in rather more than one-third. The great majority occurred in the various depôts, and there were only 12 in sea-going ships, and in only one vessel was there more than 1 case. 60·6 per cent. occurred under twenty years of age. Newly-joined recruits were specially attacked. Definite paralysis was noted in 16 cases, hemiplegia being the most frequent (8 cases), then facial paralysis without hemiplegia (5 cases); bulbar paralysis, palatal and pharyngeal paralysis, were noted in 1 case each. Nystagmus was observed in 5, and ptosis in 7 (6 fatal). Serum treatment was most disappointing, although in 66·7 per cent. of the 105 cases in which it was used it was given within the first three days of the disease. "Possibly the meningococci were 'fast' to the action of the serum, or were parameningococci." Rolleston thinks it advisable to invalid out of the service all who have recovered from an attack of cerebro-spinal fever, owing to the possibility of their being periodic or intermittent carriers. Overcrowding should be prevented, and an attempt should be made to limit all catarrhal diseases which seem to play some part in favouring the outburst of cerebro-spinal fever.

J. D. ROLLESTON.

CEREBRO-SPINAL FEVER. ERNEST MILLIGAN, *Practitioner*, 1915, xciv., June, p. 831.
(44)

CEREBRO-SPINAL fever is an acute disease in which the symptoms, while largely meningeal, are not always so; acute toxæmia may be produced from infection by meningococci. Some cases are so mild as to escape notice.

The infection is spread through the secretions of the upper respiratory tract of infected people, and some persons act as

carriers. Mild cases are a source of danger. The organism may exist in the upper respiratory passages for long periods, as in diphtheria. Isolation of contacts should be carried out as in typhus fever, together with antiseptic treatment of the upper air passages. The portal of entry is the nose, naso-pharynx, and tonsils. The secretion passes thence to the blood, or may be swallowed, and ultimately invades the brain and spinal cord. Infection may also be carried by lice, fleas, and other vermin. If the disease be suspected, Flexner and Jobling's serum should be given immediately intraspinally, before waiting for the bacteriological report of the cerebro-spinal fluid and blood.

The preventive measures suggested are :—

1. Swabbing, supervision, and disinfection of all contacts.
2. Isolation of "carriers" and infected persons, with disinfection by steam of all their belongings.
3. All persons exposed to infection and suffering from cold, sore throats, gastro-enteritis, bronchitis, or toxæmia to be regarded as cerebro-spinal fever cases till the contrary is proved.
4. Patients to be nursed in the open air.
5. Inspection for vermin among troops, with disinfectant baths when found.
6. All food exposed to infection to be destroyed. Sputum to be received on rags and burnt.
7. Mild and "missed" cases to be searched for.
8. Prophylactic vaccine treatment.
9. Sanitary authorities, where the disease is present, to supply antimeningococcic serum free to doctors. A. NINIAN BRUCE.

CEREBRO-SPINAL MENINGITIS, with notes on two epidemics. E. (45) NORMAN BUTLER, *Lancet*, 1915, April 3, p. 692.

THESE two epidemics occurred in East Africa, where the disease is so virulent that in 1913 it killed, in one tribe, numbers variously estimated at 20,000 to 40,000. In certain places it is always endemic and seldom epidemic, *e.g.*, Uganda and Mombasa, while in the highlands of British East Africa it usually appears in virulent epidemic form.

The first epidemic here described consisted of eight cases among natives, with four deaths and four complete recoveries. The second epidemic occurred among military porters, and was more virulent.

SIX general types or degrees of acuteness could be distinguished: (*a*) Fulminating type (1) with rigidity, (2) with flaccidity, (*b*) acute type, (*c*) common less acute type, (*d*) subacute type, (*e*) no symptoms of cerebro-spinal meningitis, (*f*) spinal type.

A. NINIAN BRUCE.

EPIDEMIC CEREBRO-SPINAL MENINGITIS. FREDERICK E.
(46) BATTEN, *Lancet*, 1915, May 8, p. 964.

AN excellent account of the disease under the headings of epidemiology, experimental work, clinical features, diagnosis, and treatment. In untreated cases the mortality is from 70 to 80 per cent. Serum treatment has diminished this to from 25 to 27 per cent. Soamin is not to be recommended on account of its tendency to produce optic atrophy. It is usually given in 1 to 3 grain doses dissolved in water and injected intramuscularly on alternate days. It is stated that there is no case on record where optic atrophy has been caused by less than 60 grains. A. NINIAN BRUCE.

ETIOLOGY AND PREVENTION OF CEREBRO-SPINAL FEVER.
(47) HALLIDAY SUTHERLAND, *Lancet*, 1915, Oct. 16, p. 862.

A BRIEF description of the disease along the lines indicated in the title. A. NINIAN BRUCE.

NOTE ON A CASE OF CEREBRO-SPINAL MENINGITIS: THE
(48) **TENACITY OF THE MENINGOCOCCUS.** HENRY J. ALFORD *Lancet*, 1915, May 8, p. 967.

A CASE showing that the meningococcus may live for as long as two months in the naso-pharynx. A. NINIAN BRUCE.

ARTHRITIS OF THE KNEE WITH EFFUSION AND EPIDIDY-
(49) **MITIS IN CEREBRO-SPINAL MENINGITIS. (Arthrite du genou avec épanchement et épididymite dans la méningite cérébro-spinale.)** H. LACAZE and H. ESBACH, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1919, xxxix., p. 1029.

SOLDIER, aged 21. The knee was aspirated, and pus was evacuated, showing polymorphonuclears but no micro-organisms. Subcutaneous injections of anti-meningococcic serum were given in the abdominal wall. Recovery. J. D. ROLLESTON.

CEREBRO-SPINAL FEVER AND THE SPHENOIDAL SINUS.
(50) DENNIS EMBLETON and E. A. PETERS, *Lancet*, 1915, May 22, p. 1078.

SPHENOIDAL empyema is associated with cerebro-spinal fever in a causal manner. Cerebro-spinal fever is a meningitis due to organisms entering the meninges from the sphenoidal sinus by way of the lymphatics. Adults are less susceptible owing to a diminished tendency to sphenoidal empyema, as they are not

prone to excessive swelling of the mucous membrane, and so to closure of the ostia, as is seen in adolescents. It may be advisable to open the sphenoidal sinus in all cases of cerebro-spinal fever. A. NINIAN BRUCE.

CEREBRO-SPINAL MENINGITIS: MENINGOCOCCI FOUND IN
(51) **PERIPHERAL BLOOD FILMS.** ALFRED C. COLES, *Lancet*, 1915, April 10, p. 750.

A MAN, aged 33, a carpenter, died fifty hours after the onset of the first symptom from what appeared to be clinically profound septicæmia. There were no symptoms of meningitis, although it was suspected. Films from the blood of the ear showed a large number of meningococci. The author inquires whether the meningococci are only to be found in films from the peripheral blood in the septicæmic type of the disease, and suggests that possibly the disease may be conveyed by some blood-sucking insect. He quotes a very acute case following a bite on the back of the neck. A. NINIAN BRUCE.

A CLASSIFICATION OF MENINGOCOCCI BASED ON GROUP
(52) **AGGLUTINATION OBTAINED WITH MONOVALENT IMMUNE RABBIT SERUM.** ARTHUR W. M. ELLIS, *Brit. Med. Journ.*, 1915, Dec. 18, p. 881.

THE causative agent of cerebro-spinal fever, the meningococcus, is of at least two types. These two types are, as regards the one immune reaction tested, agglutination, absolutely independent. In a study of forty-six strains of meningococci, obtained from various sources, all were of one or other of these two types. Both types are widely distributed, having been found in each of six epidemic foci. They may occur with equal frequency. Both types have been found in the naso-pharynx of healthy carriers. In so far as evidence is available, Type I. has been more frequently the cause of the disease in the recent epidemics than has Type II. In view of the wide distribution of the two types, both must, however, be held equally responsible as causative agents of cerebro-spinal fever. The organism here described as Type II. is probably identical with the parameningococcus of Dopter. It is suggested that in the treatment of cerebro-spinal fever better results might be obtained, and more exact knowledge of the adequacy of serum treatment gained, if monovalent horse serum of appropriate type, and therefore known to be active against the infecting organism, were employed in place of the polyvalent serums at present in use.

A. NINIAN BRUCE.

GROUPING OF THE STRAINS OF MENINGOCOCCUS isolated during the epidemic of cerebro-spinal meningitis in 1915. JOSEPH A. ARKWRIGHT, *Brit. Med. Journ.*, 1915, Dec. 18, p. 885.

(53)

THIRTY out of thirty-two strains of meningococci tested agglutinated with a polyvalent rabbit serum prepared with six strains isolated in the same epidemic. Thirty strains isolated during the present epidemic fall into two main groups according to agglutination tests. Five other strains presented difficulties in their classification. These two main groups correspond to Dopter's classification into meningococcic and parameningococcic. The numbers falling into the two groups—meningococcic and parameningococcic—were 18 and 12 respectively, that is 3 to 2. There is some evidence that two of the five unclassified strains were intermediate in character between the two main groups. Neither group was more frequently found among cases from one district than from another. Rapidly fatal cases of meningitis occurred in infection with either type of meningococci.

A. NINIAN BRUCE.

A CONTRIBUTION TO THE STUDY OF THE ETIOLOGICAL FACTOR IN SO-CALLED CEREBRO-SPINAL FEVER. R. DONALDSON, *Lancet*, 1915, June 26, p. 1333.

(54)

THE cerebro-spinal fluids were examined from seventy cases in an epidemic which occurred at Reading. The author started his work with the view that the meningococcus of Weichselbaum was responsible for the disease, and in every fluid found a Gram-negative diplococcus. But he also noticed that other organisms were present also. These were sometimes coccal and Gram-positive, others were Gram-negative rods, and others consisted of minute Gram-positive dots placed a short distance apart, as if at either end of a short bacillus, which was sometimes represented by a faint Gram-negative rod.

The author records some experiments, from which he has come to the conclusion that the causal organism of this epidemic was a diphtheroid rod closely related to the Klebs-Löffler bacillus, of which it may actually be a variant, and that we are witnessing, as Osler says, the struggle of a new disease to win a place among the great epidemics of the world. This diphtheroid rod is an extremely pleomorphous organism, and may give rise to Hoffmann-like forms, to what appear to be meningococci, &c. It is probably very widely spread in nature in one of its more resistant forms, and it is this form and not the meningococcal one which is transmitted from one to another. The disease may give rise to the most diverse symptoms, evidently due to an actual invasion

of the body by the infective agent, and not merely to the action of toxins manufactured locally. It is in this respect that it differs from diphtheria as we understand it.

He points out the comparative uselessness of examining contacts for the meningococcus forms only, and that if the meningococcus is merely a phase in the life history of a diphtheroid organism, the administration of Flexner's serum could only benefit those cases in which the disease was due to the meningococcal forms. He suggests that a search should be made for diphtheroid rod-shaped forms in connection with the gonococcus.

A. NINIAN BRUCE.

THE PLEOMORPHISM OF THE MENINGOCOCCUS. ALEX. (55) LUNDIE, D. J. THOMAS, and S. FLEMING, *Lancet*, 1915, Sept. 25, p. 693.

THE pleomorphism of the meningococcus is now admitted by every one, and its tendency to assume involution forms very early on solid media is of diagnostic value. Some cases, which proved to be cerebro-spinal meningitis at autopsy, show the presence of other organisms during life, and there appears to be a seasonal incidence in the prevalence of such cases. Great help is obtained from the study of organisms associated with the meningococcus in the throat and blood. Every "carrier" has a naso-pharyngeal catarrh, and "streptococci" of an extremely variable and delicate type, and showing a great tendency to give rise to involution forms, could be cultivated. "Zeppelins" and "bombs" are the most apt descriptions of some of these forms. They are usually Gram-positive, but become Gram-negative on culture. Occasionally bipolar organisms, which might readily be mistaken for Klebs-Löffler bacilli, were found. Others were like Hofmann's bacillus, and culture experiments show they can change from the one form to the other. In certain old cultures the meningococci show a tendency to grow out into filaments.

These facts may give a clue to the evolutionary descent of the meningococcus. The "streptococcus" closely resembles the hormogonium of the ordinary nostoc, while the "Zeppelin" recalls the teleutospore of the œcidiomycetes. It is a recognised principle of evolution that "ontogeny is phylogeny," and that the individual in its development recapitulates the life history of the species. If this principle be further applied it may ultimately explain the seasonal incidence of epidemic diseases in general.

A. NINIAN BRUCE.

ON THE NECESSITY OF CONTINUING INJECTIONS OF SERUM
(56) **IN PROLONGED AND RELAPSING FORMS OF MENINGOCOCCAL MENINGITIS. (Sur la nécessité de poursuivre les injections de sérum de certaines formes prolongées et à reprises de méningites cérébro-spinale à méningocoques.)** NOBÉCOURT, J. DES CAMIERS, and L. CAUSSADE, *Bull. et mém. Soc. méd. des Hôp. de Paris*, 1915, xxxix., p. 1058.

A RECORD of a case in a soldier, aged 20. The disease had an acute onset and prolonged course, lasting more than nine weeks, during which the patient had twenty-two injections, or a total of 390 c.c. After the 6th injection, when he had received a total of 140 c.c., the serum reactions became more or less intense, consisting in severe headache and backache, rise of temperature, and vomiting. After the 16th, 17th, and 18th injections, when he had had 300 c.c., 320 c.c., and 340 c.c. respectively, the symptoms were more severe, viz., tachycardia, small pulse, feeble heart sounds, dyspnœa, and Cheyne-Stokes breathing. Complete recovery took place. J. D. ROLLESTON.

ACUTE PRIMARY CEREBRO-SPINAL MENINGITIS DUE TO THE
(57) **PARATYPHOID A BACILLUS. (Un cas de méningite cérébro-spinale aiguë primitive à bacille paratyphique A.)** TOLMER and WEISSENBACH, *Paris Méd.*, 1915, v., p. 372.

A SOLDIER, sent off duty for bronchitis, was found on admission to hospital to present signs of cerebro-spinal meningitis. Lumbar puncture gave issue to a turbid fluid from which the paratyphoid A bacillus was cultivated. Death took place rapidly. The necropsy showed diffuse meningitis and left broncho-pneumonia. The only lesion in the bowel was a slight inflammation of the last 15 cm. of the small intestine. The paratyphoid A bacillus was cultivated post mortem from the cerebro-spinal fluid, the pus in the bronchi, and the spleen; it was not found in the intestinal contents. J. D. ROLLESTON.

TWO CASES OF TETRAGENUS CEREBRO-SPINAL MENINGITIS.
(58) **(Deux cas de méningite cérébro-spinale à tétragènes.)** F. RAMOND and A. RÉSIBOIS, *Progrès méd.*, 1914-15, p. 463.

A RECORD of two cases in soldiers, aged 25 and 28 respectively. In both, the cerebro-spinal fluid was turbid and showed the presence of *Tetragenus aureus*. In addition to meningitis, the first case showed almost all the symptoms described by Lenglet as characteristic of tetragenus infection, viz., high fever, diarrhœa, respiratory and vasomotor troubles; the second case had intestinal

disturbance only. Treatment consisted first in the injection of antimeningococcus serum, and later, when the nature of the meningitis was recognised, in the injection of colloidal gold.

Rapid recovery took place in both cases.

J. D. ROLLESTON.

ON THE TYPHOID AND PARATYPHOID FLORA OF THE
(59) **CEREBRO-SPINAL FLUID.** (**Sur la flore typhique et paratyphique du liquide céphalo-rachidien.**) G. DAUMÉZON, *Bull. de l'Acad. de Méd.*, 1915, lxxiv., p. 123.

A BACTERIOLOGICAL description of two cases in soldiers who presented symptoms of cerebro-spinal meningitis, but whose cerebro-spinal fluid showed the typhoid bacillus and a variety of paratyphoid bacillus respectively. The cases resembled those recently reported by Orticoni and Ameuille of early meningeal symptoms in typhoid fever (*v. Review*, 1915, xii., p. 284).

J. D. ROLLESTON.

THE FULMINATING FORM OF OTOGENIC MENINGITIS.
(60) (**Méningite otogène à forme foudroyante.**) H. PERRIN, *Thèses de Lyon*, 1914-15, No. 11.

OTOGENIC meningitis has almost always a rapid course. In certain cases it may be fatal in less than twenty-four or forty-eight hours, and may then be called "fulminating." Perrin has collected twenty-one fatal cases, five of which are original. The latter occurred exclusively in soldiers in the course of a few months, so that the bad hygienic conditions prevailing among them during the winter campaign probably played a part in the causation. Anatomically the meninges showed a discrete but diffuse suppuration. The symptoms were those common to all cases of acute generalised meningitis. J. D. ROLLESTON.

MUMPS AND PARAMENINGOCOCCUS CEREBRO-SPINAL MEN-
(61) **INGITIS. CURE BY INTRASPINAL LUMBAR AND CERVICAL INJECTIONS OF DOPTER'S ANTIPARAMENINGOCOCCUS SERUM. TRANSITORY APPEARANCE OF FROIN'S SYNDROME.** (**Oreillons et méningite à paraméningocoques. Guérison par injections intrarachidiennes lombaires et cervicales de sérum antiparaméningococcique de Dopter. Apparition transitoire de syndrome de Froin.**) P. RAVAUT and G. KROLUNITZKY, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 618.

A SOLDIER, aged 28, was admitted to hospital with mumps, complicated by meningitis. The cerebro-spinal fluid was purulent, and showed polynucleosis and diplococci. No improvement

followed injection of antimeningococcus serum, of which 275 c.c. in all were given. The cocci were shown to be parameningococci, and antiparameningococcus serum was substituted, but it was not until 365 c.c. of this serum had been injected that recovery took place. The disease lasted about two months.

In the course of the treatment it became impossible to remove much cerebro-spinal fluid, in spite of the use of the stilette, change of position of the needle, &c., and each time that the quantity of serum injected exceeded that of the cerebro-spinal fluid removed, an attack occurred resembling an epileptic fit. This was at first attributed to anaphylaxis, but subsequently the writers put it down to hypertension only. The difficulty in withdrawing fluid made them resort to punctures in the cervical region, where it was easily obtained. The punctures were made in the mid line between the sixth and seventh cervical vertebræ, directing the needle from below upwards.

The occurrence of Froin's syndrome, *i.e.*, coagulation *en masse* of the cerebro-spinal fluid with xanthochromia, was due to meningeal hæmorrhage produced by lumbar puncture.

J. D. ROLLESTON.

TETANUS.

AN ANALYSIS OF CASES OF TETANUS TREATED IN HOME MILITARY HOSPITALS FROM AUGUST 1914 TO AUGUST 1915. Sir DAVID BRUCE, *Brit. Med. Journ.*, 1915, Oct. 23, p. 593 (3 diagrams); *Lancet*, 1915, Oct. 23, p. 901 (illust.).

(62)

THE conclusions arrived at by this analysis are as follows:—

1. In the 231 cases of tetanus under review the mortality was 57·7 per cent.

2. Cases with a short incubation were more fatal than those of longer incubation.

3. Most cases occurred on the tenth day after the wound.

4. There are few allusions to the use of anti-tetanic serum as a prophylactic.

5. In regard to the therapeutic effect of anti-tetanic serum, the evidence would go to show that this action is not well marked.

6. If anti-tetanic serum is used—and in such a fatal disease it would seem wrong not to give the patient the benefit, even if doubtful, of the antitoxin—it ought to be injected in the first place intrathecally, as this method would seem to possess advantages over the intravenous and subcutaneous methods.

7. There is no evidence that any benefit accrued to the cases treated by carbolic acid or magnesium sulphate injections.

8. To sum up, the treatment of a case of tetanus might be as follows:—

(*a*) Place in a quiet, darkened room under care of a sympathetic and capable nurse.

(*b*) The best surgical treatment of the wound should be thoroughly carried out to ensure the prompt and complete removal of all septic products.

(*c*) The intrathecal injection of at least 3,000 units of anti-tetanic serum. At the same time 10,000 to 20,000 units may be injected intravenously and subcutaneously. This procedure to be repeated as frequently as the course of the disease seems to demand.

(*d*) In addition to this the patient should receive sedative drugs, such as chloral or chloretone, in full doses.

A. NINIAN BRUCE.

THE PROPHYLAXIS OF TETANUS: A Summary. A. T. MACCONKEY,
(63) *Brit. Med. Journ.*, 1915, Dec., ii., p. 849.

THE experience gained during the first year of the war has confirmed the opinion that from 500 to 1,000 U.S.A. units of tetanus antitoxin is a sufficiently large prophylactic dose for the majority of cases, and that it is advisable, in severe wounds, to repeat the dose once or twice at intervals of a week. Occasionally cases occur in which antitoxin appears to have little preventive effect. These cases should be recorded with minute details, so that our knowledge of them may be increased and an explanation of their occurrence obtained. Those cases of tetanus which develop some weeks after the receipt of an injury may be due to the reactivation of a quiescent focus by too early or too energetic active or passive movement. A. NINIAN BRUCE.

PSEUDO-TETANIC SYMPTOMS IN THE WOUNDED, WITH
(64) **NERVE LESIONS COMPLICATED BY THE PRESENCE OF FOREIGN BODIES. (Accidents pseudo-tétaniques chez des blessés atteints de lésions des nerfs compliquées de la présence de corps étrangers.)** R. LE FORT, *Bull. de l'Acad. de Méd.*, 1915, lxxiv., p. 200.

A RECORD of three cases in soldiers, aged from 23-32, in whom fragments of shells caused the development of severe neuritis characterised by contractures of the lower limbs with pseudo-tetanic convulsive movements. In none did the spasms pass above the waist, none showed trismus or nuchal rigidity, and all recovered after removal of the foreign body. All had undergone anti-tetanic vaccination. J. D. ROLLESTON.

CASES OF TETANUS-LIKE SPASM LOCALISED TO THE WOUNDED LIMB. R. D. RUDOLF, *Lancet*, 1915, Nov. 13, p. 1084.
(65)

THREE cases are described of wounds in the leg, which were followed by constant spasm of the muscles, which stood out like iron. Any handling of the part would cause violent contractions, which would cause the patient to cry out in agony and sweat profusely. Anti-tetanic serum was given as a precaution. The condition gradually improved without spreading to any other part of the body, being strictly localised to the wounded limb.

A. NINIAN BRUCE.

NOTE ON A CASE OF ACUTE TETANUS: RECOVERY. F. J. FARRELL and G. G. MECREDY, *Lancet*, 1915, Jan. 2, p. 17.
(66)

A MAN, aged 28, while leading a restive horse, sustained a small abrasion on the left hip. The wound was so trivial that he took no notice of it. *Two* days later stiffness of the neck developed, but he did not consult a doctor for another four days. 3,000 units of anti-tetanic serum were given the following day, and the wound swabbed with liq. iodi fort. During the next four days 15,000 units were given subcutaneously and intramuscularly. He became steadily worse, and the convulsions had to be controlled by chloroform. 10 drachms of cerebro-spinal fluid were then removed, and 4,500 units of the serum injected intraspinally, with 8,000 units intravenously and 1,500 subcutaneously. He became wildly delirious. The serum treatment was continued subcutaneously, and although the delirium lasted ten days he made an uninterrupted recovery.

A. NINIAN BRUCE.

NOTES ON A CASE OF TETANUS OF SHORT INCUBATION PERIOD, WITH RECOVERY. R. LESTER SCOTT, *Lancet*, 1915, Oct. 30, p. 974.
(67)

AN officer was wounded on the left thigh by the accidental discharge of a flare pistol. The wound suppurated badly, and was operated upon three days later. The initial symptoms of tetanus commenced thirty hours after the operation, and *five* days after the patient was wounded. The attack was a severe one, characterised by clonic and tonic seizures, associated with great pain. The essence of the treatment consisted in the administration of immediate, persistent, and almost extravagant serum-therapy, the total amount of serum administered being 102,000 units. The intravenous and intrathecal administrations of the serum were given under chloroform anæsthesia. The result of the treatment was an uncomplicated recovery, with entire absence

of secondary lesions. It was thought that the operation had laid bare fresh tissues, and there resulted rapid absorption of toxins which had already been elaborated in the necrosed area.

A. NINIAN BRUCE.

A CASE OF SEVERE TETANUS: RECOVERY AFTER INTRA-
(68) **CEREBRAL INJECTION.** NORMAN SCOTT and C. H. BARBER, *Lancet*, 1915, July 24, p. 180.

A MOSLEM was admitted to hospital with trismus, easily evoked prolonged spasms in the sterno-mastoids, deltoids, biceps, pectorals, and recti abdominales, and rigidity in both legs. His friends said he had been ill *five* days. No external wound could be found. Next day he was worse, with opisthotonos, so 5 c.c. of Pasteur Institute anti-tetanic serum were injected into each cerebral hemisphere after turning down a small flap at Roux's point and drilling a hole in the skull. On shaving the scalp a small scabbed-over wound was discovered over the left parietal bone. 5 c.c. were also given intravenously. Next day he was better, and 10 c.c. of serum were given intravenously and hypodermic injections of 5 c.c. of 1/40 carbolic acid. Still greater improvement followed next day, when another 10 c.c. were given intravenously. He was discharged cured twenty-four days after admission to hospital.

A. NINIAN BRUCE.

A CASE OF ACUTE TETANUS WITH RECOVERY. A. G. WHITE-
(69) HORNE-COLE and W. M. S. ROBINSON, *Lancet*, 1915, Feb. 20, p. 370.

A SOLDIER was admitted to hospital on 26th October with two shrapnel wounds, one on the right thigh, the other on the left knee-joint. The wounds were cleaned, the thigh wound being treated with iodine irrigations. On 1st November stiffness in the jaws and the back of the neck developed, with "burning" pain in the thigh wound. In the afternoon he was given 1,500 units of antitetanic serum subcutaneously. Next day trismus was marked with risus sardonicus and violent jerking movements. The above dose was repeated. Next day, 3rd November, the abdomen was retracted and board-like, and the back was arched. Next day the condition was unchanged, and he was given 3,000 units intrathecally, with chloral four-hourly. Gradual recovery took place, all signs of tetanus having disappeared by 18th November.

A. NINIAN BRUCE.

A CASE OF TETANUS: RECOVERY. G. P. NEWBOLT, *Brit. Med.*
(70) *Journ.*, 1915, Feb. 20, p. 333.

A BELGIAN soldier was wounded on 20th October, in the left forearm, and developed cellulitis. The arm was opened and

drained. Tetanus developed on the evening of the *eighth* day. He recovered after seventeen doses of anti-tetanic serum, each of 1,500 units, and injections of 15 minims of 1 in 20 carbolic acid.

A. NINIAN BRUCE.

TWO CASES OF RECOVERY FROM SEVERE LATE TETANUS.

(71) **(Deux cas de tétanos tardif guéri.)** M. PÉRAIRE, *Bull. et mém. Soc. de méd. de Paris*, 1915, p. 270.

BOTH cases occurred in wounded soldiers who had received prophylactic doses of anti-tetanic serum two and four days respectively after being wounded. In the first case tetanus developed *eight* days after the injection, and in the second *ten* days after the injection. Both recovered after treatment with anti-tetanic serum associated with injections of carbolic acid and chloral and bromide internally.

These cases show that immunisation by anti-tetanic serum is of very short duration. After one or two weeks only a partial immunity is left. A larger quantity of serum should be put at the disposal of physicians and surgeons. J. D. ROLLESTON.

REPORT OF A CASE OF TETANUS, WITH RECOVERY.

(72) J. MURPHY, *Med. Record*, 1915, lxxxviii., p. 483.

A MAN, aged 26, developed tetanus after an incubation period of *nine* days. In the course of the next nine days he received 7,500 units of tetanus antitoxin subcutaneously, 9,000 units intravenously, and 6,000 units intrathecally. Intramuscular injections of 10 per cent. solution of carbolic acid in 10 minim doses were given two-hourly until the urine became smoky. The twitching was controlled by chloral and bromides. The patient was discharged cured three weeks after the last injection of antitoxin.

J. D. ROLLESTON.

A CASE OF TRAUMATIC TETANUS. A CURIOUS FACTOR COMPLICATING EARLY DIAGNOSIS.

(73) JOHN D. HAYWARD, *Lancet*, 1915, clxxxix., Oct. 2, p. 757.

A SOLDIER, aged 19, was injured in the right side of the face. There was right-sided facial paralysis, and a bullet was found by the X-rays lying under the zygoma, between the condylar process of the jaw and the mastoid, causing difficulty in opening the mouth. Anti-tetanic serum was given on the *fourth* day after the injury. Distinct signs of tetanus developed on the *tenth* day, but the position of the bullet rather masked the earliest symptoms, and the increased inability to separate the teeth and the rigidity

of the masseters were not noticed until the retraction of the head drew attention to them. He was given anti-tetanic serum and carbolic acid injections into the erector spinæ, and ultimately recovered.

Acute tetanus has been defined as that developing in less than ten days after injury. This case was thus just on the border line, and suggests that the serum may have an influence on a subacute case, even when given four days after the date of the wound.

A. NINIAN BRUCE.

A CASE OF TETANUS OCCURRING TEN WEEKS AFTER INJURY.
(74) ALEXANDER DON, *Lancet*, 1915, June 12, p. 1233.

A PRIVATE, aged 40, was wounded in the right shoulder on 21st December. Anti-tetanic serum was administered on 23rd December. Symptoms of tetanus developed on 2nd March, and the tetanus bacillus was discovered in the pus and in a piece of bone which extruded from the wound. Up to 18th March he was given 47,000 unit doses varying from 3,000 U.S. units a day to 20,000. It was noticed that the severity of the spasms and of pain varied inversely as the number of units injected. An attempt to give an intrathecal injection was made twice, but the first time the opisthotonic spasms made it impossible. The second time 2,000 Lister Institute units were injected, but the patient became unconscious and moribund, and appeared to be suffering from cerebro-spinal meningitis, which was attributed to irritation from the serum. For some days his condition was very critical, but the spasms gradually ceased, and he recovered.

A. NINIAN BRUCE.

ON THE CURATIVE ACTION OF ANTI-TETANIC SERUM. (De
(75) **l'action curative du sérum antitétanique.)** G. MILIAN and LESURE, *Paris méd.*, 1915, v., p. 394.

THE patient was a soldier, in whom the symptoms had been present for six days before he received appropriate treatment. He had no external wound, and the symptoms had been attributed to a wisdom tooth. The subcutaneous injection of 60 c.c. of anti-tetanic serum caused almost immediate improvement, lasting thirty-six to forty-eight hours. The symptoms then returned, but disappeared after another injection. Recovery took place after three injections, or a total of 180 c.c. injected subcutaneously in the course of a week.

J. D. ROLLESTON.

A CASE OF RELAPSE OF TETANUS. (Ein Fall von Tetanusrezidiv.)
(76) H. BRANDT, *Zentralbl. f. innere Med.*, 1915, xxvii., p. 565.

RELAPSES in tetanus are very rare. There is only one case hitherto recorded, viz., by Sick, in a patient who had three attacks at intervals of six weeks. Brandt's case occurred in a soldier, aged 23, who was wounded in the foot on 26th December by a piece of shrapnel which was removed on the eighth day. On 15th January signs of tetanus developed. Treatment consisted in intramuscular injections of antitoxin, intraspinous injections of magnesium sulphate, and chloral hydrate internally, and by 18th February he became convalescent. On 10th April a relapse took place. There could be no question of fresh infection, as the patient had been in bed all the time, and had had no opportunity for re-infection. The relapse was more severe than the primary attack, inasmuch as there were frequent dyspnœal attacks, but recovery was more rapid. The relapse was treated by chloral and salicyl only. The case illustrates the favourable prognosis of tetanus with a long incubation period (*v. Review*, 1915, xiii., p. 126). J. D. ROLLESTON.

INJECTION OF OXYGEN AS A TREATMENT FOR TETANUS.
(77) H. O. HOWITT and D. H. JONES, *Lancet*, 1915, April 10, p. 752.

AS the tetanus bacillus is an obligate anaerobe, and will not develop in the presence of the smallest amount of oxygen, it was thought that the injection of oxygen into a tetanus wound and tissue round about might prevent, or at least delay, the onset of the disease.

Cultures were accordingly injected into eight guinea-pigs, half of whom were also given a subcutaneous injection of oxygen. These latter lived longer than the former who received no oxygen. No clinical cases are recorded. A. NINIAN BRUCE.

COLLOIDAL IODINE ASSOCIATED WITH SERUM TREATMENT IN TETANUS.
(78) AUREGAN, *Lancet*, 1915, Feb. 27, p. 430.

TEN tetanus patients were treated by serotherapy without colloidal iodine treatment, and of these 4 recovered and 6 died, giving a percentage of 40 recoveries. 14 patients were treated by serum therapy combined with colloidal iodine treatment; 10 recovered and 4 died, giving a percentage of 68·8 recoveries. Colloidal iodine tends to raise the opsonic index as well as to increase the alexic power. Whether administered as intramuscular injections, or as a dressing for wounds, it never caused any local reaction,

pain, or rise of temperature, and is absolutely harmless. In 8 of the above cases where it was used the amount of anti-tetanic serum which had to be given was diminished.

Records of the 24 cases are given. A. NINIAN BRUCE.

THE USE OF MAGNESIUM SULPHATE IN THE TREATMENT
(79) **OF TETANUS, WITH AN ACCOUNT OF A SIMPLE APPARATUS FOR PHARYNGEAL INSUFFLATION.** S. J. MELTZER, *Lancet*, 1915, June 26, p. 1330.

IN most cases of tetanus death results from the effect of the spasms upon respiration and circulation. The author considers that the spasms can be relieved by the use of magnesium sulphate more effectively than by any other method. It may be administered in one of four ways: (1) Subcutaneously, (2) intramuscularly, combined with inhalation of ether, (3) intravenously, and (4) intraspinally. Except for the intravenous injection, the magnesium salt should be given in a 25 per cent. (molecular) solution. For subcutaneous injection the dose should be not more than 2 c.c., and not less than 1·2 c c. of the solution per kilogramme of body weight, to be injected four times in twenty-four hours. They exert their effects slowly, and thus cannot relieve dangerous spasms. Intramuscular injections are more efficient if combined with a moderate inhalation of ether. Chloroform does not exert such an effect. 2 c.c. of the magnesium sulphate solution per body weight should be injected into the muscles of the thigh, followed by massage. This may relieve severe spasms in less than half an hour, but the effect passes off after two or three hours. For intravenous injection the concentration should be about 3 per cent. (isotonic), and not more than 5 c.c. per minute run into the vein. This can relieve dangerous spasms (tetanus of diaphragm, constriction of larynx, &c.) more promptly than any other method, but the benefit lasts less than thirty minutes, but it must be reserved for emergency cases only, as there is a direct action upon the myocardium. Intraspinal injection is best of all, because it may cause complete relaxation after one hour, and the relief may last from twelve to thirty hours.

"Any case of tetanus, mild or severe, should from the start to finish be treated by subcutaneous injections about every six hours with doses of magnesium sulphate. Cases having severe attacks should receive in addition an intraspinal injection." "If the attack contains an element of immediate danger, an intravenous injection may be administered." "When for one reason or another the intraspinal and intravenous injections are not

practicable the intramuscular injection, plus ether, may be resorted to. When treating tetanus by magnesium sulphate, preparations for artificial respiration ought to be made in order to be able to use efficient doses of the salt. The pharyngeal insufflation device is the simplest and most reliable method for this purpose. When this device is not at hand, then oxygen should be administered by the method of intratracheal insufflation through the tracheotomy wound." This treatment does not, of course, exclude serum treatment.

A simple apparatus for pharyngeal insufflation as a reliable method for artificial respiration in cases of emergency is described.

A. NINIAN BRUCE.

GENERAL.

A RARE COMPLICATION OF MUMPS: BILATERAL PARALYSIS
(80) **OF THE BRACHIAL PLEXUS OF THE UPPER ROOT TYPE. (Une complication rare des oreillons: paralysie double du plexus brachial à type radiculaire supérieur.)** P. SAINTON and C. HURIEZ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 809.

A SOLDIER, aged 22, three weeks after mumps, complicated by orchitis, developed severe pain in both upper limbs, rapidly followed by paralysis and anæsthesia. The muscles of Erb's group were affected, and also the supra- and infra-spinatus, serratus magnus, and trapezius. Recovery gradually took place, and only a slight weakness was left due to an atrophy of a part of the deltoid, which, however, was diminishing daily. No other causes for the paralysis could be found except mumps. The patient had never shown any signs of syphilis, and Wassermann's reaction was negative. There was no evidence of plumbism.

There are two theories to account for paralysis in mumps. Most authors regard the paralysis as the result of a neuritis of infective origin. Dopter, on the other hand, owing to the frequency of spinal lymphocytosis in mumps, attributes it to a serous meningitis which may be latent. In the present case, however, there was no appreciable lymphocytosis even when the paralysis was at its height, and the disease pursued the ordinary course of infective neuritis, as most of the muscles resumed their ordinary volume and contractility. The intensity of the atrophy of the deltoid resembling that found in severe cases of plumbism was a striking feature of the case.

J. D. ROLLESTON.

TRAUMATIC ADDISON'S DISEASE: DIFFUSE PIGMENTATION
(81) **OF THE SKIN AFTER A BULLET WOUND IN THE SUPRARENAL REGION. (Diffuse Pigmentierung der Haut nach Schussverletzung in der Nebennierengegend. Traumatische Addisonche Krankheit.)** W. FISCHER and H. LESCHCZINER, *Dermat. Wochenschr.*, 1915, lxii., p. 1115.

A SOLDIER, aged 21, was wounded in the region of the right suprarenal by a bullet on 12th February 1915. The wound had healed by 24th February, but in the beginning of March a marked brown pigmentation of the skin of the abdomen was noticed, for which no external cause could be found. The increase of pigmentation was shown microscopically to be due to deposit of pigment granules in the rete Malpighi. Further examination showed the following symptoms: (1) Lymphocytosis, 39 per cent.; (2) fall of blood-pressure; (3) hypoglycæmia 0·07-0·048 (normal, 0·08-0·09), and rise of tolerance for carbohydrates; (4) slight changes in urine metabolism; (5) rapid exhaustion after physical exertion; (6) mental depression; (7) gradually increasing pigmentation of the skin, starting in the abdomen and spreading to the axillæ, inguinal regions, and rest of the trunk (mucosæ still unaffected); (8) increase of pigmentation shown in pieces of skin removed and examined by Meirowsky and Bittorf's methods.

The writers conclude that these symptoms were due to injury to the right suprarenal or to its sympathetic nerve supply.

Hitherto only two cases of traumatic Addison's disease have been recorded (Borrmann, *Arch. f. klin. Med.*, 1906; Riemann, *Inauguraldiss.*, München, 1913). J. D. ROLLESTON.

ANOMALIES OF THE VISUAL APPARATUS, OF THE INTELLI-
(82) **GENCE AND SKELETON ASSOCIATED WITH GENERAL NEUROFIBROMATOSIS. (Anomalies de l'appareil visuel, de l'intelligence et du squelette associées à la neurofibromatose généralisée.)** E. JEANSELME, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1136.

THE patient, a soldier, aged 26, presented the punctate pigmentation, blue spots, and molluscous tumours characteristic of Recklinghausen's disease, but no thickening of the nerves. The following visual anomalies were noted: bilateral microphthalmus, a slight degree of internal strabismus, bilateral horizontal nystagmus, and a moderate degree of myopia with slight astigmatism.

The patient was mentally deficient. The chief skeletal defects were dorsal scoliosis and hemiatrophy of the left side of the skull. The X-rays showed that the sella turcica was not more than one-third of its normal capacity. There were no signs of infantilism, and there was no syndrome suggesting incompetence of the glands of internal secretion. J. D. ROLLESTON.

A CASE OF OPTIC NEURITIS FOLLOWING ON "GASSING."
(83) G. FINCH, *Lancet*, 1916, Nov. 6, p. 1027.

A SOLDIER who was "gassed" at Ypres, but did not lose consciousness, began to suffer from headaches and loss of sight. The Wassermann reaction was negative, and an examination of the fundus some time later showed obvious signs of secondary atrophy and neuritis. It is suggested that the condition might be infective, possibly associated with an ethmoiditis due to the gas.

A. NINIAN BRUCE.

PSYCHIATRY.

MENTAL DEFECTIVES IN WAR: THEIR UTILISATION. (Les
(84) **débiles mentaux à la guerre. Leur utilisation.)** L. P. PRUVOST, *Thèses de Paris*, 1915-16, No. 23.

SINCE the outbreak of the war, Pruvost has met with only a few cases of insanity, and those only of an ordinary kind, and has not observed any special war psychosis. On the other hand, he has been struck by the increasing number of mental defectives in the army. Their presence is partly due to the need for more men, which has relaxed the severity of the medical examination, and partly to the development of a hitherto latent mental infirmity under the stress of war conditions. According to the degree of mental defect the patient should be discharged, placed in the auxiliary forces, or allowed on active service, where he may prove an excellent soldier.

Twenty-two illustrative cases are recorded, seven of which are original.

J. D. ROLLESTON.

THE WAR AND PSYCHIATRY. ISABEL EMSLIE, *Edinburgh Med.*
(85) *Journ.*, 1915, xiv., May, p. 359.

JUDGING from the admissions to the Royal Mental Hospital, Edinburgh, the war has not made any increase in insanity in civilians, *i.e.*, amongst those who not actually experienced warfare. Few normal persons seem to have been affected. Among those in which insanity may be said to have been caused by the war, the great proportion are those who have had previous attacks, and those who are weak-minded or very highly strung. Many of the admissions, though not actually caused by the war, show that it was playing a large part in their psychoses. This was very noticeable in the admissions which occurred in the first month or two after the commencement of the war. It has gradually got less and less frequent. This would seem to show that the mental shock of the war is not so keenly felt now, by the unstable mind, as when the blow first fell.

Of patients already suffering from psychosis when the war started, it could not be said that one had a relapse which might be traced to the war. The patients who were most affected were the paranoiacs, who, though they apparently had a normal outlook on the war, had their own distorted views of it, and had developed many and varied delusions. Descriptions of a number of cases are given. A. NINIAN BRUCE.

Reviews

CEREBRO-SPINAL FEVER. THOMAS J. HORDER. Pp. 179, with (86) 17 illustrations. Oxford War Primers. Henry Frowde and Hodder & Stoughton, London. 1915. Pr. 3s. 6d. net.

"THE winter of 1914-15 and the spring of 1915 have seen many more cases of cerebro-spinal fever in England than at any other time since the disease has been recognised." Its appearance in the form of a mild but widespread epidemic accompanying the concentration of troops in various parts of the country has necessitated a more intimate knowledge of its origin, diagnosis, and treatment, and as no short manual has been published in this country giving concisely the important points of the disease, this book is presented in the hope that it may fill such a position.

It gives shortly, but clearly and without elaborate discussion, the principal features of "cerebro-spinal fever" which require to be recognised by those who have to deal with the disease. It is primarily intended for actual practice, and thus such practical details as the method of performing lumbar puncture, the staining of the meningococcus, the characters of the cerebro-spinal fluid in health, &c., are included.

The disease is discussed from the points of view of epidemiology, symptomatology, diagnosis, complications and sequels, pathology, prognosis, treatment and prophylaxis. Due attention is paid to the need of the recognition and careful treatment of "carriers."

When it appears amongst troops, it attacks only those living in barracks and garrison towns, not those in the field. It is largely due to overcrowding, and may be carried from place to place by the transfer of troops, as has occurred in France. It shows a very striking seasonal incidence, being a disease of the winter and spring. The meningococcus is very apt to be overlooked, as its exact habitat is the upper part of the nasopharynx and the posterior nares. It seems probable that permanent carriers do exist, although they have not yet been proved, and the spread of infection is by direct

contact, *e.g.*, minute droplets of buccal secretion accompanying speech, coughing or sneezing. Contagion by dried sputa is unlikely.

The most recent methods of serum treatment are all included, and we feel sure that the object of the author will be realised, as this is the book which we should recommend to anyone wishing a working knowledge of the condition.

NERVE INJURIES AND SHOCK. WILFRED HARRIS. Pp. 123. (87) **Oxford War Primers. Henry Frowde and Hodder & Stoughton, London. 1915. Price 3s. 6d. net.**

AN outstanding feature of the casualties in the present war is the very large number of cases of nervous exhaustion, neurasthenia, and functional paralysis of various kinds which are being met with. Many of these result from high explosive shell, the man being buried in a trench, or thrown down and rendered temporarily unconscious without any local injury. On recovering consciousness, a flaccid paralysis, or loss of speech or sight, or some other symptom is left behind as evidence of loss of function from nervous shock. These cases have to be carefully distinguished from malingerers. They represent psychical rather than physical injuries, and with proper methods of suggestive treatment can nearly all be cured, or at least greatly ameliorated. The important features of the various forms of functional nervous injuries which may be met with are described here, together with the appropriate treatment. The style is simple and straightforward.

The book is divided into two parts. Part I. deals with the "Direct Effects of Injuries of the Nervous System," and Part II. with "Nervous Shock following Cerebral Injury." The latter part is particularly good. A large number of useful hints in the diagnosis and treatment are given, and we close the book with a distinct feeling of wishing that it had been a little larger.

BOOKS AND PAMPHLETS RECEIVED.

Llewellyn, Ll. Jones, and Jones, A. Bassett. "Fibrositis." Pp. xxxv+693, with 134 figs. Wm. Heinemann, London, 1915. Pr. 25s. net.

Macnamara, N. C. "Instinct and Intelligence." Pp. viii+216, with 17 figs. Henry Frowde and Hodder & Stoughton, London, 1915. Pr. 6s. net.

Mills, Charles K. "The Nursing and Care of the Insane." Pp. 142. Third edition. J. B. Lippincott Co., London. Pr. 5s. net.

Salmon, Alberto. "Il Sonno" (*Riv. Sper. di Freniat.*, 1915, xli.).

Salmon, Alberto. "L'Isterismo" (*Riforma Med.*, 1914, xxx.).

Salmon, Alberto, and Maestrelli, Antonio. "Di un caso di paralisi associata del nervo oculo-motore esterno e del faciale" (*Estratto dallo Sperimentali*, 1915, lxix.).

Tanzi, E., and Lugaro, E. "Malattie Mentali." Vol. II. Second edition. Societa Editrice Milano, Italy. Pr. L. 25.

"Reports of the Clinical Conferences of the Neurological Institute of New York," 1914-15.

Review
of
Neurology and Psychiatry

Original Articles

EXTREME CALCIFICATION IN THE BRAIN OF A SUBJECT WITH MENTAL SYMPTOMS.*

By A. E. TAFT, M.D.,
Curator, Department of Neuropathology in the Harvard Medical School.

THERE are a variety of conditions under which calcification may exist. Rokitansky describes it as being found in an overgrowth of connective tissue in apoplectic cysts, and in encephalitic foci, the extent varying between wide limits. It may also take place in primarily undegenerated tissue. He reports a case of calcification in the brain of a paralytic idiot, and quotes Bamberger's report (p. 474), of the brain of an idiot, 34 years of age, who was subject to nocturnal attacks of epilepsy, in which the small cerebral vessels were found uniformly calcified, and there was a calcareous mass in the corpus striatum.

Mallory has reported a carefully studied case, without mental symptoms, in which the condition is much the same, though apparently not quite so extensive as the one under consideration. He very clearly describes the process as one of colloid infiltration

* The specimen described was received from the Danvers State Hospital, Hathorne, Massachusetts, No. 1431. Acknowledgment is made to the Hospital for the use of the material and records, and to the Massachusetts State Board of Insanity—Dr E. E. Southard, Pathologist—for the use of the photographs reproduced in the article.

and calcification; the largest concretions the size of grains of barley. There is a tendency to localise near the basal ganglia.

Catola reports a case of calcification in the basal ganglia of a tabetic, 50 years of age. Fine calcareous points could be felt on the surface, and the concretions were found both about the blood vessels and also in the midst of the tissue with no vascular relation. He found no neuroglia increase surrounding the rigid-walled arteries.

Oberndorfer describes a case in a female subject, 17 years of age. In the right hemisphere of the brain, beneath the cortex of the frontal, temporal, and parietal areas, were four calcareous foci varying from the size of a cherry to that of a walnut. No history of cerebral disturbance. It is supposed that the process is an old encephalitis with circumscribed softenings, and later calcification of the necrotic tissue. The calcareous masses are embedded in unaltered brain substance.

Dürck has examined a case of extreme calcification of brain tissue in a subject 19 years old at death. There were convulsions since early childhood, and at the age of three years there developed weakness and atrophy of the right side. At first there was some mental development, but later he became entirely demented, was unable to talk, walked with uncertain gait, and had severe epileptic attacks. Post-mortem examination showed a markedly asymmetrical skull; the entire left hemisphere smaller than the right, and of the consistence of cartilage. Contralateral cerebellar asymmetry. On cutting the brain it was found to be calcified almost the entire length of the hemisphere in the *centrum semi ovale*. The gyri were rough as though sprinkled with sand. The cause in this case was concluded to be due to faulty nutrition, from pressure of the overlying diffusely angiomatous pia.

In the discussion of Dürck's paper several cases were reported which represent the variations of condition under which calcification may be found. Among those were the following:—

M. Landau—Case of hæmorrhagic encephalitis in a five weeks' old child, with extensive calcification.

F. Marchand—Case of extensive calcification with "angioma racemosum arteriale," limited to the temporal lobe. Patient insane.

C. Zenoni—Calcification of hemisphere in 21 year old idiot, with hemiatrophy and chronic fibrous leptomeningitis. Process mainly along vessels.

M. Askanzy and Weber—Extensive calcification with brain tumour. Some of the calcified areas were far from the tumour.

F. Vanzetti—Calcification in brain of male, age 40 years, who manifested grave nervous symptoms terminating in dementia and epilepsy. Process mainly in basal ganglia and in the deep portions of the convolutions of both hemispheres. Mainly perivascular.

The Case.

The brain was received from an insane hospital to be photographed in a series diagnosed dementia præcox. The provisional diagnosis was recorded as unclassified, with a possibility of dementia præcox, or manic depressive insanity. The specimen presented no anomaly on inspection, and had not been considered remarkable in any way (Plate I.) It was only when an attempt was made to cut frontal sections that calcified areas were discovered.

No. 15,582. Female. Age 34 years. Onset at 33 years. Married. Housewife. Four children; youngest 2 years of age. Hospital residence three months, twenty-six days. Cause of death, lobar pneumonia.

History given by husband: Father alive and well; always considered peculiar; uses alcohol to excess. Unable to give history of patient's ancestry or brothers and sisters.

Past history: Born 34 years ago; graduated from grammar school; helped her mother with housework until she married at twenty-six years. Married life happy until recently. Habits: never used alcohol to excess; occasionally a glass of beer.

Illnesses: Six months ago had symptoms of lung trouble, and was treated by physician. No history of injuries. One year ago, when her mother died, she became despondent, and the doctor advised admission to the hospital. Suffered from insomnia, restless at night, and sad. Remained so until two months ago, when two young girls came to room at the house. They were lively and stayed out at nights, and asked the patient to go with them. This excited her very much, and her husband had great difficulty in keeping her at home. Got angry and threw things at him; made excuses to get out of the house.

According to the physician's certificate, June 2, 1910: Onset gradual, June 1909. She is extremely excitable; hurled dishes at her husband. Was going to smash up everything. The family say she is constantly trying to run away, and carries some kind

of pills in her handbag. Refused medical treatment for fear of being poisoned.

Physical Examination, June 4, 1910: Very poorly developed and emaciated. Cheeks red; tongue protudes in median line with fine tremor. *Respiratory system*—Dulness in both apices; many fine moist rales on right above second rib. *Circulatory system*—Superficial arteries show no thickening. Area of cardiac dulness somewhat increased. Heart sounds loud and forcible; no murmurs. *Abdomen*—Hard and rigid; no fat in abdominal wall. Skin lax. Abdomen everywhere tender. Deep pressure over eleventh rib causes considerable pain. No gland palpable in groin.

Neurological Examination.—No Romberg; nothing in particular about gait. Cranial and pharyngeal reflexes present and normal. Pupils central, and react to light and distance. K. J. extra active. Superficial skin reflexes active. Arm jerks exaggerated. No clonus nor Babinski.

June 28, 1910.—Patient remained quietly in bed the first week after admission, then began to get excited and destructive, so it became necessary to keep her in a room by herself. Pulled the bed apart and wrapped herself in the quilts and lay on the floor, with the clothes usually wrapped tightly about her head; would not converse, and hid her face as soon as uncovered. Untidy, somewhat restless. Never noisy until her hair was combed, then would strike and scream. Shows no speech defects; no flight of ideas. Has been tried in continuous bath, but owing to weakened condition could not be left long enough to get full effect.

Mental Examination, August 23, 1910.—Has been placed in seclusion. Not violent. Was lying on the floor. Went through senseless mannerisms, covering her head and wringing her hands. Has a tendency to repeat meaningless phrases over and over; speech is rapid and often words run together. Has flight of ideas. Attention poor. Answers fragmentary and irrelevant. Changeable moods. Impossible to get any connected conversation with her, as she wandered from one theme to another rapidly. On the whole nervous and depressed. *Hallucinations*—Active; says she hears father and mother talking to her in this room. She says she answers these voices. Sees cows, calves, and farmers; is not afraid. *Disoriented* for time and place, also for person. *Memory*—Recent and remote, very poor. *Vision*—Normal for colour. Tells time correctly. Recognises familiar objects correctly.

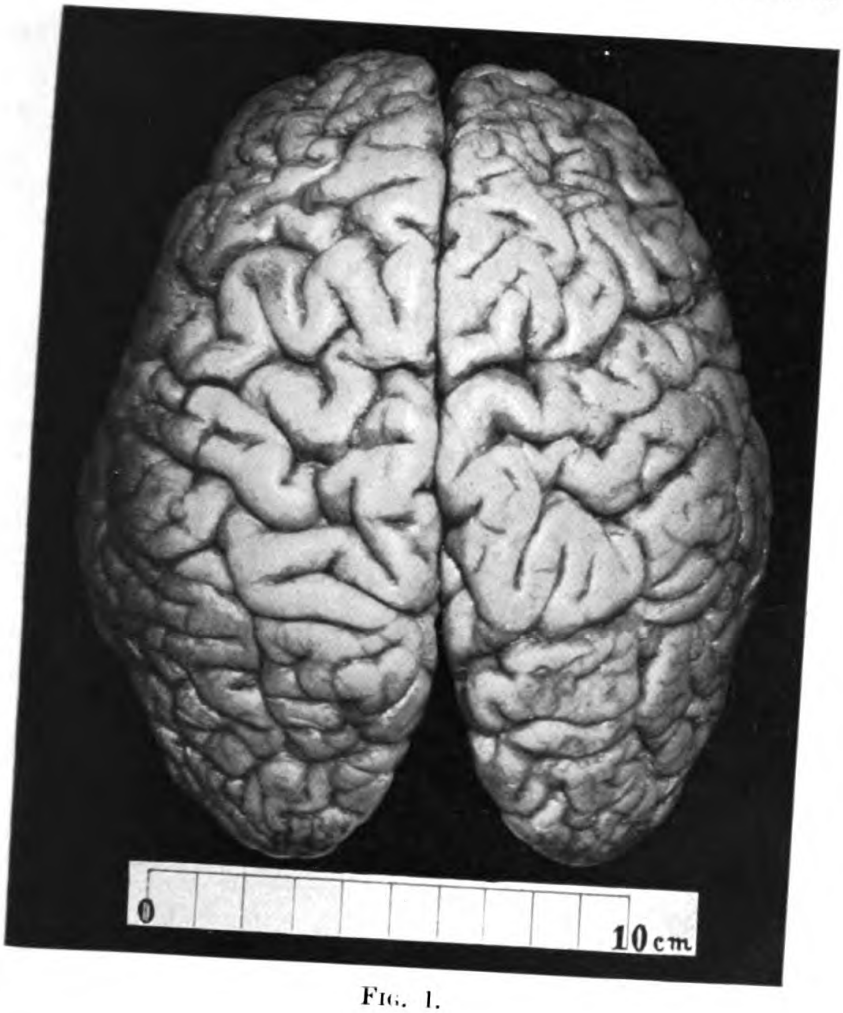


FIG. 1.

FIG. 2.

School knowledge—Deficient, or not retained. *Insight*—Lacking; says she is not sick; that her head aches all the time. She is perfectly satisfied to stay here, and likes it. *Handwriting*—Writes names correctly and legibly, then runs on and writes a list of meaningless words until told to stop.

September 1, 1910.—Condition not much changed. Restless and untidy. Prefers floor to the bed. Will not converse with examiner.

September 29, 1910.—Great deal of motor restlessness, indicative of central irritation. Prolonged baths some beneficial effect, but no general improvement.

Died September 29, 1910. Lobar pneumonia.

Post-Mortem Examination.

Autopsy, September 30, 1910.—31½ hours post-mortem. Slight alopecia occipitalis. Supra pubic glands palpable. Little abdominal fat; omentum almost without fat. Adhesions about appendix; peritoneum otherwise negative. Stones in gall bladder. 50 c.c. clear yellow fluid in pelvis.

Thorax.—Adhesions at base and apex of left lung. Right lung adherent to diaphragm. 50 c.c. clear yellow fluid in pericardium; wall smooth and glistening. No epicardial fat. Bronchial lymph nodes enlarged on both sides. *Heart* small, muscles dark red, vessels sclerosed. *Lungs*—Right lower and middle lobes consolidated. Thyroid small. Thymus present, 0.5 cm. broad. 6-7 parathyroids. *Abdomen* negative.

Head.—Hair dark brown, short. Calvarium rather thick. Dura not noteworthy. On opening dura considerable fluid escapes. Over fissure of Rolando dura puffed out; underneath is a thin serous fluid and calcareous deposits. Considerable cerebro-spinal fluid escapes on removing the brain. *Pituitary* red, otherwise negative. *Middle ears negative.* Brain weight, 1,120 gm. Generally firm. Cerebral arteries not markedly sclerosed. *Cord* not unusual.

Macroscopical Examination.

The brain is dolichocephalic in type. The pia is only slightly thickened, and there is very little enlargement of the arachnoid villi. The convolutions have fairly rounded summits which do

not lie in the same plane, and they are generally rather narrow. The pattern is usually complex, with the most noticeable simplicity in the parietal regions of both hemispheres. The frontal gyri tend toward transverse arrangement, though this is not marked. The fissure of Rolando runs very nearly at right angles with the longitudinal fissure, and does not cut the margin, but is separated from it by a narrow gyrus, which forms the superior border of the paracentral lobule. The postcentral sulcus (ascending and descending branches of the interparietal) runs almost exactly parallel with the fissure of Rolando, and suggests a duplication of the latter. The orbital surfaces point upward, both frontally and laterally. This produces the keel-shaped effect of the gyri recti frequently seen in various degrees of retarded cerebral development. In keeping with this is the upward pointing of the lips of frontal and parietal opercula. The only point on the base of the brain worthy of particular note is the bilateral focus between the third temporal and the fusiform gyrus, where the sulcus is considerably widened. The corpus callosum is quite narrow in its horizontal portion, including the upper surface of the knee.

There is no considerable sulcal atrophy, although the summits of the gyri are not closely approximated.

The surfaces of the cerebellum are not remarkable. The basal vessels are small, and there is no apparent change in their walls.

Frontal sections through the entire brain showed a number of the large foci of calcification nearly symmetrically situated in both hemispheres (Plate II.). The process on the right extends from a point about 3·5 cm. from the tip of the frontal lobe, following the lateral curve of the corpus callosum like a rod, just above the caudate nucleus, a distance of approximately 4·5 cm. in length. Owing to the solidity of its structure, the mass could have been removed intact from the brain tissue in which it was embedded. The diameter of this calcified body is roughly $0{\cdot}6 \times 0{\cdot}8$ cm. In addition to this there is another area of calcification in the lenticular nucleus on this side, beginning at its anterior extremity and occupying about one-third of the upper portion of the putamen adjacent to the internal capsule; posteriorly it separates into two portions, one occupying the superior angle, and the other the angle formed by the internal

capsule and the globus pallidus. This area extends slightly further backward than the one in the overlying white matter.

In the left hemisphere there is a roughly rounded focus just external and superior to the anterior extremity of the horn of the lateral ventricle. This increases in size and consistence for a short distance, then becomes smaller and extends backward, making its entire length about 3·8 cm. in diameter. The extreme anterior and posterior portions are not solidly calcified, but where the process reaches its greatest size, about 0·7 cm. from its anterior extremity, it is 0·7 cm. in diameter, and is stony in consistence. The lenticular nucleus on this side also contains a definitely calcified process extending through its entire length, and in very nearly the same situation as that found on the right side. Here, however, the process of infiltration (not gross calcification) has invaded the superior angle of the optic thalamus, an area roughly $0{\cdot}5 \times 0{\cdot}7$ cm. in diameter. On section of the cerebellum, the dentate nuclei were found to be filled with hard granules, which could be separated quite easily from the surrounding tissue.

Microscopical Examination.

After decalcification in 5 per cent. nitric acid until a teasing needle could be inserted into the calcified foci without resistance, the material was imbedded in celloidin and sections cut through the whole brain. These whole brain sections were stained by the Weigert myelin sheath method, and with Mallory's aniline blue connective tissue stain. Small blocks from the cortex had been taken, and after embedding in paraffin these were stained for cell studies with *Cresylechtviolett*. One block from a chosen calcified focus was stained with hæmatoxylin and eosin. The areas examined were:—

- Upper precentral.
- Upper postcentral.
- Middle postcentral.
- First transverse temporal.
- Calcarine.
- First temporal: posterior two-thirds.
- Superior parietal.
- Superior frontal.
- Prefrontal.
- Island of Reil.
- Medulla.
- Cord.
- Subcortical block through calcified focus.

There are no very marked changes in the cortex in general. Occasional foci of glia cell increase are found in the plexiform layer. The outer layer of pyramidal cells over the summits of the precentral gyri are somewhat thinned, and there is a moderate degree of patchy thinning in the deeper cell layers of the post-central region. This is also true of the sections from the posterior portion of the first temporal gyri. The calcarine cortex shows no alteration. In the parietal region the outer layer of large pyramids is moderately thinned, and this is particularly so over the summit of the gyrus. The frontal and prefrontal gyri sections show slight thinning of large pyramids, and of the cells in the deep layers. There is nowhere any perivascular exudate, except very occasionally a granular, pigmented phagocyte about the vessels in the white substance.

The cord is negative except for a slight glia cell increase about some of the anterior horn nerve cells.

In the medulla there is an area of dense colloid material about the central canal beneath the ependyma. Aside from this the sections from this region are not notable.

The whole brain sections show that the extent of the infiltration of colloid and the process of calcification is much greater than is apparent in the gross. The calcified areas which appear as large concretions macroscopically, are made up microscopically of an intricate network of overlapping plaques, which vary in density and stain metachromatically. The branching outline suggest coral formations. Scattered about in this structure are small so-called mulberry-shaped concretions, and small granules more or less round or oval. All this is embedded in a rather coarse glia tissue. The branching outlines first suggest calcified blood vessels, but they are not, as vessel walls are not seen embedded in the mass, but appear between the colloid material. These vessels are found to vary widely in their state of preservation. Some appear quite normal; the walls of some are very much thickened, representing the true sclerosis without calcification; and in others the walls are not appreciably thickened, but the outer layers are infiltrated with colloid granules of varying sizes. In a few the infiltration appears wholly perivascular. In the region surrounding these large calcareous masses there are numerous large and small granules; many with concentric arrangement of their layers, as well as small branching forms with nodular outline. Still further from

the centre of the main foci, and penetrating peripherally for a considerable distance, all the capillaries are surrounded by colloid granules. It is particularly to be noted that the subcortical gray matter, wherever found, seems to be a point of election for the perivascular deposits of colloid droplets, while the blood vessels of the adjacent intervening white substance is uniformly free. On the other hand, the cerebral cortex is almost entirely unaffected; only rarely a few very minute granules are found there. It is notable that the largest calcified foci are situated in the white matter, and the less extreme degrees are limited to the gray cellular substance at the base of the brain.

The cerebellum is involved to a less degree. The dentate nuclei contain similar large plaques in the postero-superior portion. Some of the capillaries in the white matter, and frequently in the granular layer of the cortex, are thickly encrusted with colloid granules. Others in the same area, and lying between the infiltrated vessels, are entirely unaffected.

Conclusion.

The calcareous masses present in the base of the brain may be compared to multiple foreign bodies. The increase of coarse neuroglia fibres immediately surrounding the calcified foci show, first, that the lesion had produced local irritation; and second, that the condition has existed for a considerable length of time. The absence of any cellular reaction rules out the presence of an inflammatory process. The clinical symptoms of motor restlessness and increased reflexes accord with the fact that the *corona radiata* of both sides were involved. Accounting for the mental symptoms is a more difficult task, both on account of the extent and varied distribution of the lesion, and the narrow limit of definite knowledge concerning the localisation of psychic function. No satisfactory correlation can be made with the findings of Southard in his study of the dementia præcox group.

In general, the presence of large areas of calcification, extending through the cortical fibre tracts of the frontal and superior parietal regions, and the invasion of the optic thalamus, including the pulvinar, may account both for the hallucinations and the complex mental state.

Concerning the age of the pathological process, the existing

condition is not represented, most likely, by the duration of symptoms. That a considerable degree of calcification may exist without causing mental disturbance is evidenced by Mallory's case already quoted in this paper.

Although the causal relations of colloid infiltration and calcification in brain tissues are not to be considered here, it may be added that the picture bears a certain resemblance to that frequently seen in nerve tissues from senile cases, in which the periphery and posterior columns of the spinal cord, and the cornu Ammonis in the cerebrum, show varying degrees of neuroglia-fibre overgrowth, with numerous colloid granules enmeshed.

SUMMARY.

The case was one considered clinically as dementia præcox, or manic depressive insanity without definite diagnostic symptoms. There were active visual and auditory hallucinations. Headache. Motor excitability. Tendon reflexes increased. Duration of symptoms, one year.

The brain presented no anomaly on inspection and palpation.

Frontal sections showed gross areas of calcification nearly symmetrically placed in both hemispheres.

The calcareous areas extend antero-posteriorly, and are in the white substance at the upper and outer angle of the lateral ventricle on either side; in the lenticular nucleus, and in a less degree in the optic thalamus. In the cerebellum there are concretions in both dentate nuclei.

Microscopically the calcareous areas, both in the cerebrum and cerebellum, appear as intricately branching plaques with nodular processes having no apparent vascular relation. Small granules are diffusely scattered about in the white substance. There is an associated glia-fibre increase in these areas.

The blood vessels of the cerebral basal ganglia are surrounded by colloid droplets. These invade the vessel walls in varying degrees. In the white substance some of the vessel walls are much thickened, with no infiltration.

The cerebral cortex is not involved in the calcareous process.

LITERATURE.

(1) ROKITANSKY. "Pathological Anatomy." Vol. ii., p. 471. 1856.
(2) MALLORY, F. B. "A Contribution to the Study of Calcareous Concretions in the Brain." *Journal of Pathology and Bacteriology*, Edinburgh and London, Nov. 1894.
(3) CATOLA, G. "Note sur les concretions calcaires dans le cerveau." *Nouv. Icon. de la Salpetriere*, Paris, 1904, xvii., pp. 354-357.
(4) OBERNDORFER. "Verkalkungs und Verknocherungsherde im Gehirn." *Verhandl. d. Deutch. Path. Gesellsch.*, Jena, 1915, xv., p. 316.
(5) DÜRCK, H. "Ueber fast totale Verkalkung einer Grosshirnhemisphare bei einen Erwachsenen Individuum." *Att. d. Cong. internaz. dei pathologi*, 1911, Torino, 1912, pp. 238-253.
(6) SOUTHARD, E. E. A Study of the Dementia Præcox Group in the Light of Certain Cases showing Anomalies or Scleroses in Particular Brain-Regions. Proceedings of the American Medico-Psychological Association, Sixty-sixth Annual Meeting, Washington, D.C., May, 1910.

Abstracts.

ANATOMY.

ENDOCRANIAL CASTS AND BRAIN FORM: A CRITICISM OF
(88) **SOME RECENT SPECULATIONS.** J. SYMINGTON, *Journ. Anat. and Physiol.*, 1916, l., Jan., p. 111.

DUBOIS, Boule and Anthony, and Elliot Smith have all endeavoured to show from endocranial casts of certain prehistoric skulls that the corresponding brains were of a "primitive" type.

Thus Dubois, in describing the endocranial cast of *Pithecanthropus erectus*, writes:—"The intraparietal fissure is only very partially distinct, but seeming to point to a relatively large occipital lobe, an ape-like condition, undoubtedly consequent on a relatively larger development of the sensory centres of the cortex in contrast with smaller areas of association."

Boule and Anthony, in the case of the La Chapelle man, assert that: "Si le volume relativement considérable de son encéphale constitue un argument en faveur de son intelligence, l'aspect grossier de toutes les circonvolutions visible paraît au contraire, indiquer des facultés intellectuelles rudimentaires."

Elliot Smith, more decided, writes with regard to the Piltdown brain: "Taking all its features into consideration, we must regard this as being the most primitive and most simian brain so far recorded"; while Smith Woodword, in a more popular account of

this prehistoric man, says: "So far as they can be distinguished, the convolutions of the brain are simpler than those of modern man, and there are certain parts which remain scarcely more developed than they are in a modern child."

In opposition to these views, Symington asserts:—

1. That the simplicity or complexity of the cerebral fissures and convolutions cannot be determined with any degree of accuracy from endocranial casts, even on complete skulls, much less on reconstructions from imperfect skulls.

2. That it is not possible to estimate, even approximately, from the La Chapelle or Piltdown endocranial cast the relative degree of development of the various sensory and association centres in the cortex.

3. That the various deductions made by Boule, Anthony, Elliot Smith, and others, with reference to the primitive and simian features of the brains of certain prehistoric men, from an examination of their endocranial casts, are highly speculative and fallacious.

A. NINIAN BRUCE.

PHYSIOLOGY.

(89) **POST-NATAL GROWTH OF THE BRAIN UNDER SEVERAL EXPERIMENTAL CONDITIONS: STUDIES ON THE ALBINO RAT.** H. H. DONALDSON, S. HATAI, and H. D. KING. *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 797.

THE object of these studies was to find how far the growth of the nervous system might be modified under several sets of conditions —some of which apply to man. The growth changes have been followed mainly in the brain by determining (1) its absolute weight, (2) its relative weight (in relation to the body), (3) the proportional weights of its parts, (4) the progress of myelination, (5) the percentage of water. The experimental measures have consisted of domestication, inbreeding, disease, exercise, modified rations, and gonadectomy. In general it may be stated that while inbreeding and gonadectomy do not modify brain growth relatively or absolutely, a deficient wholesome ration does give an absolutely small brain, which, however, is *not otherwise* modified.

The greatest modification is found in the domesticated albino as contrasted with the wild Norway. Much smaller unfavourable modifications are produced by disease, by a lipoid free ration, and by the ration in which maize furnishes the protein.

If these studies can be applied to man, then it follows that gonadectomy does not modify brain growth, while disease and some defective diets do modify it unfavourably. On the other hand, exercise modifies it favourably. D. K. HENDERSON.

PSYCHOLOGY.

A MODERN MYSTIC. TH. FLOURNOY, *Archives de Psychologie*, 1915. (90) May, p. 1.

THE whole of this number, amounting to over 200 pages, is devoted to an account of the spiritual experiences of Mlle. Cécile Vé. These had two phases, denoted by the terms *the Invisible Presence* or *the Spiritual Friend*, and *the Divine Experience* or *the Mystic Ecstasy*. They are described in the subject's own words, written down at the time and sent to M. Flournoy for his eye alone. It was only later, and at his earnest request, that Mlle. Vé consented to their publication. Hence the documents form a valuable contribution to the psychology of religion.

M. Flournoy traces carefully the evolution of the experiences, and seeks to lay bare their source in the previous life and hereditary tendencies of the subject. In this connection he discusses the views of Freud, Jung, and others, as to the origin of the mystic trance. Finally he devotes a few pages to a consideration of the metaphysical interpretation of the observed phenomena.

MARGARET DRUMMOND.

PATHOLOGY.

THE MICROBIC CAUSE AND MANNER OF INFECTION OF POLIOMYELITIS. SIMON FLEXNER, *Bull. Johns Hop. Hosp.*, 1915, xxvi., May, p. 180. (91)

IN a previous paper the author has shown how experimental poliomyelitis may be produced in monkeys by the inoculation of human tissues; from the affected nervous tissues the identical micro-organism was recovered in cultures. Moreover, a filtrate prepared by passing through a Berkefeld filter an emulsion of the same nervous tissues was capable of conveying infection to other monkeys. Of the different cultures of the micro-organism obtained, however, only a few were capable of causing experimental poliomyelitis on inoculation, the greater number of cultures proving inactive or non-pathogenic.

This is now explained by the fact that the virus of poliomyelitis is highly parasitic, residing and multiplying only within animals subject to its pathogenic action, and it is known that such highly parasitised micro-organisms, when artificially cultivated, lose wholly or in part their pathogenic action.

Other experiments have now been done in regard to the survival of the micro-organism in artificial cultures, and it is shown how the cultivated micro-organism, separated from the nervous tissues for more than a year, and after many generations and indefinite dilution of the original materials subjected to

cultivation, is capable, on successive inoculation into monkeys, of setting up the lesions accompanied by the symptoms of experimental poliomyelitis.

The author briefly gives his reasons for believing that the infective agent of poliomyelitis is borne and disseminated by persons rather than by insects. He states that only under very highly exceptional conditions may the stable-fly withdraw virus containing blood from the monkey and reinoculate it into other but healthy monkeys, which in time may develop the symptoms and lesions of poliomyelitis.

On the other hand, the virus of the disease has been ascertained both to enter and to leave the infected subject by way of the naso-pharyngeal mucous membrane. It has been found not only in frank cases, but also in the slight so-called abortive ones, and even in healthy persons who have been in intimate contact with active cases. As far as the dissemination of the disease is concerned, the abortive cases are the greatest menace, but the passive and chronic carriers also play an important rôle. The bizarrre and puzzling occurrence of cases of poliomyelitis, separated often by miles, can only be explained in this way.

D. K. HENDERSON.

CLINICAL NEUROLOGY.

(92) **NEW CLINICAL INSTRUMENTS FOR THE MORE PRECISE ESTIMATION OF MUSCLE STRENGTH AND THE TENDON REFLEX THRESHOLD: THE CLINICAL MYOSTHENOMETER AND REFLEX LIMINOMETER.** FREDERICK TILNEY, *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Nov., p. 721.

THE several varieties of dynamometer at present in use are either too limited in their applicability or too complex to be of the greatest clinical service. Accordingly, a myosthenometer has been devised which has the widest possible range of application, and at the same time is portable and relatively simple.

Realising the difficulty of obtaining a correct evaluation of the deep reflexes, the author has deemed it advisable to produce an instrument (the reflex liminometer) which might be controlled in three definite respects: (1) In delivering a percussion blow at the same point of the tendon upon any number of repeated applications of the percussion; (2) the delivering of a blow of known force on each percussion made; (3) to so grade the force of the blow that the least amount of impact necessary to develop the faintest trace of the reflex might be recorded. Both of the above instruments are described and illustrated.

D. K. HENDERSON.

REFLEX SYNKINESIS OF THE ORBICULARIS PALPEBRARUM
(93) **IN CONTRACTURE FROM PERIPHERAL NEURITIS OF VII. (Sincinesia riflessa dell' orbicolare delle palpebre nella contrattura per nevrite periferica del vii°.)** G. D'ABUNDO, *Riv. ital. di Neuropatol., Psichiatr. ed Elettroter.*, 1915, viii., p. 302.

IN five cases of unilateral neuritis of vii., with well-marked contracture, d'Abundo has recently noted that when the patient opens his mouth suddenly and wide, a reflex contraction occurs which is localised to the internal portion of the orbicularis palpebrarum on the side of the neuritis. When the mouth is closed this symptom does not occur. If the contracture is of slight degree, the reflex contraction of the orbicularis is less marked, and may easily escape notice. If a patient with unilateral contracture of vii. develops peripheral neuritis of the nerve of the opposite side, the reflex contraction is not affected.

D'Abundo regards the phenomenon as an automatic reflex of defence, to which various factors contribute, including a mechanical one, as well as the proximity to one another of the motor nuclei of v. and vii. J. D. ROLLESTON.

TARDY OR LATE PARALYSIS OF THE ULNAR NERVE: A
(94) **FORM OF CHRONIC PROGRESSIVE NEURITIS DEVELOPING MANY YEARS AFTER FRACTURE OF THE ELBOW JOINT.** J. RAMSAY HUNT, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 1, p. 2 (2 figs.).

LATE paralysis of the ulnar nerve is a well-defined clinical type of chronic interstitial neuritis, consequent on old injuries and deformities about the elbow joint. The interval of time elapsing between the reception of the original joint lesion and the onset of neuritic symptoms may vary from six to thirty-nine years. During this latent period there are no symptoms other than those referable to the deformity and restricted movements of the elbow joint. The joint lesions most commonly associated with this form of neuritis are those resulting from old fractures and dislocations about the elbow joint, and very rarely old arthritis. Especially frequent is the fracture of the external condyle with cubitus valgus and alterations in the configuration of the ulnar groove.

The neuritic symptoms are slowly progressive, and run an extremely chronic course. They consist of atrophic paralysis limited to the ulnar distribution with corresponding sensory disturbances. The sensory symptoms, both subjective and objective, may be insignificant, and in the earlier stages are absent.

The diagnosis rests on the presence of an old joint lesion and the neuritic character of the symptoms. In differential diagnosis

the progressive spinal atrophies and the *hypothenar type of neural atrophy* (compression neuritis of the deep palmar branch of the ulnar) will demand consideration. Surgical measures are usually necessary to check the progress of the atrophy and restore function. Among the procedures advocated in the different types of cases are: enlargement and remodelling of the ulnar groove; resection of the thickened portion of the nerve trunk; transposition of the ulnar nerve to the anterior surface of the internal condyle, and supracondyloid cuneiform osteotomy of the humerus to correct the valgus deformity. A. NINIAN BRUCE.

HERPES ZOSTER AND PARALYSIS OF ARM. F. PARKES WEBER, (95) *Brit. Journ. Dermatology*, 1915, **xxvii.**, p. 408.

A MAN, aged 64, suddenly developed paralysis of the left upper extremity. A week later typical herpes zoster was first seen, involving the left side of the head and neck, the left clavicular region and shoulder, and the upper part of the left side of the chest. Both knee jerks were exaggerated, and an ankle clonus and extensor response were obtained on the left side. Wassermann's reaction was positive.

Reference to the literature, including Doucet's thesis (*v. Review*, 1907, v., p. 789), and the paper by Alexander Bruce (*Ibid.*, p. 885).

J. D. ROLLESTON.

RECURRENT HERPES ZOSTER OF THE FACE WITH HEMIA-
(96) **TROPHY.** WILFRED TROTTER, *Proc. Roy. Soc. Med.*, 1916, **ix.**, Jan. (Dermatol. Sect.), p. 43.

A GIRL, aged 11, had an attack of herpes on the right side of the face when she was aged 1. This has recurred every two or three months since. Each attack is preceded by headache and fever, but local pain is not a marked feature. The attacks involved only the second division of the fifth cranial nerve, the lesions being limited to the centre of the right cheek and the right side of the nose. In the last attack the buccal and submental branches of the third division of the fifth nerve were also involved.

Two other points of interest were:—(1) Very marked pitted scarring at the site of previous lesions, and (2) marked atrophy of the cheek on the affected side. There were no sensory changes. The lesion appeared to be inflammatory, and to be situated in the Gasserian ganglion. A. NINIAN BRUCE.

RECKLINGHAUSEN'S DISEASE. (Recklinghausenche Krankheit.)
(97) DELBANCO, *Deutsch. Med. Woch.*, 1915, xli., p. 1173.

A WOMAN, aged 50, in addition to the characteristic molluscous tumours and pigmentation, presented a rapidly growing tumour in the popliteal space, which gave rise to severe radiating pain in the foot.

A diagnosis of malignant neuroma of the anterior tibial nerve was made, and was confirmed by operation.

Delbanco regards Recklinghausen's disease as a developmental disturbance occuring in early embryonic life, affecting the specific nerve elements, which give rise to ganglia, glia, and nerve fibre cells. The involvement of the hypophysis and chromaffine system leads to changes in the optic nerves, and manifestations resembling Addison's disease. J. D. ROLLESTON.

REPORT OF A CASE OF CENTRAL PERIPHERAL NEURO-
(98) **FIBROMATOSIS.** PETER BASSOE and FRANK NUZAM, *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 785.

THE patient was a boy, 15 years old, whose maternal grandmother had a lump on the head, and a maternal uncle had a small nodule on the forehead, but it has not been definitely determined whether these were cases of molluscum fibrosum.

When the patient was 5 years old he had an attack of pain in the right scapular region, followed by a dragging of the left foot. Since then, occurring about once a year, he had similar attacks of pain in the right scapular region, lasting from two weeks to three months. A lump on the left side of the neck was noted at least three years before death, while a large mass attached to the rectum had been discovered only a few weeks before the writer's examination.

In December 1913 he had pain beneath the right scapula, followed by pain in the left side of the abdomen, difficulty in emptying the bladder, and pain and progressive weakness in the left leg. When examined on 23rd March 1914, he was emaciated, exhausted, and could not talk above a whisper. Nodules were seen on the left side of the forehead, on the left side of the neck, and on the chest. The left leg was very weak, and passive movements of the lower extremities were painful. The right external rectus was weak, and there was diplopia on looking to the left; paresis of both divisions of the left facial nerve; impaired hearing in the left ear. The left knee jerk was absent, and the right one was weak; the ankle jerks, cremasteric, and abdominal reflexes were absent; Babinski's sign was present on the right side, while on the left side there was plantar flexion.

He gradually developed increased facial nerve weakness on both sides.

At the autopsy nodules were found on the forehead, in the left supraclavicular space, over the chest, and in the hollow of the sacrum. As regards the central nervous system, in each cerebello-pontine angle there was a tumour the size of an English walnut. There were also nodules in connection with the left third nerve, the left vagus nerve, and in the cauda equina.

The essential structure of all these tumours was of the nature of a fibroma.

D. K. HENDERSON.

TWO SUCCESSFULLY OPERATED CASES OF EXTRA-DURAL
(99) **FIBROMA COMPRESSING THE CORD.** PETER BASSOE, *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Nov., p. 736.

CASE I.—A woman, 60 years old in February 1911, was found to have complete paralysis and great rigidity of both lower extremities. Beevor's umbilical sign was present; there was knee and ankle-clonus, and a bilateral sign of Babinski; the arm reflexes were normal; the abdominal reflexes were absent. On the right side there was loss of cutaneous sensation of all kinds below the level of the umbilicus, and on the left side below a level two inches higher. A laminectomy was performed, and at the level of the eighth thoracic vertebra there was found a greyish, rather firm, extradural tumour attached to the left side of the vertebra, and measuring 2·5 by 1·5 cm. The entire tumour was removed, and the histological examination showed it to be a simple fibroma. By June 1911 the patient was able to walk out of the hospital. When seen over three years later the patient was found in excellent health, and had no difficulty in walking.

CASE II.—A married woman, 25 years old on 21st September 1913, was complaining of weakness, stiffness, and sharp pains in both lower extremities. During the development of her illness she had for a period of six months lost control of her sphincters, but then she again regained control of the rectum, and to some extent of the bladder. She was found to have a spastic paralysis of both lower extremities, with knee and ankle clonus, and Babinski's sign on both sides. The upper abdominal reflexes were present on both sides, the left lower absent, and the right lower weak. There was loss of cutaneous sensation, complete as to tactile sense, partial as to pain and temperature sense of the lower extremities, and partial loss of all sensation of the lower part of the abdomen below a horizontal line three inches above the pubis. The Nonne-Apelt globulin reaction was very strong,

and the colloidal gold test gave a marked reaction in the seventh tube. The arches of the lower five thoracic vertebræ were removed, and a soft tumour mass was found, intimately connected with the bone, particularly at the tenth vertebra. The capsule of the tumour was incised, a piece of the tumour was removed, but all that was attempted was to relieve pressure.

The patient, however, improved very rapidly, and on 12th November was able to leave the hospital. Histological examination of the tumour showed it to be a fibroma. At the present time the patient has only a little stiffness and uncertainty in walking, and slight muscular cramp. D. K. HENDERSON.

TABES TREATED WITH INTRASPINAL SUBDURAL INJECTIONS
(100) **OF NEOSALVARSAN. DEATH. (Un caso di tabe dorsale trattato con iniezioni endorachidee sottodurali di "Neosalvarsan" e seguito da morti.)** E. CIARLA, *Riv. di Patol. nerv. e ment.*, 1915, XX., p. 633.

A WOMAN, aged 64, who had suffered from tabes for fifteen years, showed some improvement after two intraspinal injections of neosalvarsan. After the third and fourth injections the diminution of the pains continued, but she suffered from obstinate constipation, had difficulty in moving her legs, and lost again sensibility to the passage of urine and fæces. Ciarla, thinking these symptoms might be interpreted as Herxheimer's reaction, gave a fifth injection, but the following day the patient showed complete flaccid paralysis and complete blindness. Gangrenous bedsores soon developed, and death took place. The first injection contained $\frac{1}{4}$ mgm. neosalvarsan, the second 1 mgm., the third 2 mgm., the fourth 3 mgm., and the fifth 6 mgm. The autopsy showed spinal pachyleptomeningitis, softening of the lower dorsal region of the cord and the epiconus, old degeneration of the posterior columns, recent and diffuse degeneration affecting the nerve cells in all the sections of the cord and the nerve fibres, chiefly in the antero-lateral columns, and recent degeneration of the fibres of the optic nerves. The recent lesions were attributed to the toxic action of neosalvarsan. J. D. ROLLESTON.

A CASE OF SERUM DISEASE AFTER INJECTION OF HUMAN
(101) **SERUM INTO THE SPINAL CANAL. (Un cas de maladie sérique après injection de sérum humain dans le canal rachidien.)** A. NETTER, *Compt. rend. Soc. de Biol.*, 1915, lxxviii., p. 505.

DURING the last five years Netter has frequently injected human serum into the spinal canal in the treatment of poliomyelitis.

This is the first case of serum disease that he has had among more than thirty-two patients so treated, and out of a total of at least 140 injections. The child was injected for the first time on 12th September, and received fresh injections on each of the three following days. A week after the first injection he developed generalised urticaria, rise of temperature, swelling of the glands, and pains in the joints. He had never been injected before, nor had he previously had urticaria.

The case proves that serum eruptions may occur after injection of homologous serum as well as after injection of heterologous serum.

J. D. ROLLESTON.

MULTIPLE NUCLEAR PARALYSES OF DIPHTHERITIC ORIGIN
(102) **WITH MENINGEAL REACTION. (Paralysies nucléaires multiples d'origine diphtérique avec réaction méningée.)** CHAUFFARD and A. LE CONTE, *Bull. et mém. Soc. méd. des Hôp. de Paris*, 1915, xxxix., p. 997.

A WOMAN, aged 42, was admitted to hospital six weeks after a sore throat, the diphtheritic nature of which was not recognised. Her symptoms were as follows: right trigeminal neuralgia, complete right facial palsy, paralysis of the right half of the soft palate, laryngeal diplegia, and paralysis of accommodation. All these symptoms disappeared in about a month except the aphasia, which persisted some time longer, but was cured by ten minutes' vibratory massage of the larynx. The organic nervous symptoms had here been succeeded by auto-suggestion.

Before admission a diagnosis of syphilitic basilar meningitis had been made, but there was no history of syphilis, Wasserman's reaction was negative, and the palatal palsy and paralysis of accommodation were characteristic of diphtheria.

The cerebro-spinal fluid showed a transient excess of albumin and slight lymphocytosis (*cf. Review*, 1908, vi., p. 712).

The case supports the theory of the central origin of certain diphtheritic paralyses (*Ibid.*, 1910, viii., p. 374).

J. D. ROLLESTON.

MENINGEAL SYNDROME AND AZOTÆMIA IN THE COURSE
(103) **OF TYPHOID FEVER. (Syndrome méningé et azotémie au cours des maladies typhoïdes.)** F. RATHERY and M. VANSTEENBERGHE, *Bull. et mém. Soc. méd. Hôp de Paris*, 1915, xxxix., p. 1056.

THOUGH typhoid bacillus meningitis has been very rare during the last epidemic in the Zuydcoote area, the writers have seen several cases with meningeal symptoms among patients suffering

from typhoid or paratyphoid. Their cerebro-spinal fluid was clear under slight hypertension, and showed no fibrin or increase of albumen. Cytological examination was negative, and the cultures were sterile. The prognosis of these cases was grave, as five out of ten died. The amount of urea both in the cerebro-spinal fluid and in the blood of these patients was increased, ranging from 0 gr. 60 to 2 gr. 20 per cent., as compared with the figures of 0 gr. 20 to 0·0 gr. 40 yielded by the ordinary cases of typhoid. J. D. ROLLESTON.

CEREBRO-SPINAL MENINGITIS COMMENCING WITH MENTAL
(104) **DISTURBANCE. (Méningite cérébro spinale débutant par des troubles mentaux.)** H. ESBACH and H. LACAZE, *Bull. et mém. Soc. Hôp de Paris*, 1915, xxxix., p. 104.

A RECORD of two cases. The first, which recovered, was in a man, aged 24, in whom the disease started with symptoms of mental confusion. The second case, which proved fatal, was in a man, aged 45, in whom melancholia marked the onset of the disease. J. D. ROLLESTON.

EXANTHEM AND RELAPSE IN EPIDEMIC CEREBRO-SPINAL
(105) **MENINGITIS. (Exanthem und Rezidiv bei Meningitis epidemica.)** H. MORGENSTERN, *Deutsch. Med. Woch.*, 1915, xli., p. 1363.

A RECORD of two cases in women. The first had two relapses. The primary attack was mistaken for rheumatism with a purpuric eruption; the first relapse, which occurred two and a half weeks later, was recognised as cerebro-spinal meningitis, and treated with serum, and the second relapse, which occurred five weeks after recovery from the first, was treated successfully by lumbar puncture only.

In the second case the relapse occurred about a fortnight after recovery from the primary attack, and ran a more severe course. Morgenstern does not know of any other cases on record of relapse in cerebro-spinal meningitis (but *v. Review*, 1910, viii., p. 502—J. D. R.). J. D. ROLLESTON.

CEREBRO-SPINAL MENINGITIS (MIXED INFECTION BY MENIN-
(106) **GOCOCCI AND COLI BACILLI). (Méningite cérébro-spinale à méningocoques et colibacilles associés.)** DUHOT and BOEZ, *L'Encéphale*, 1915, Dec., p. 175.

THE patient was a pregnant woman of 34, who presented the usual symptoms of severe cerebro-spinal meningitis, and whose

illness lasted twenty-six days, and terminated fatally. Meningococci were easily recovered in the cerebro-spinal fluid. They persisted to the very end of the illness, in spite of the appearance of coli bacilli in the fluid in ever-increasing quantity. Acetone was present in the urine, and in the fluid throughout the course of the malady. Apparently the *B. coli* infection was the sequel to an otitis media of which the patient complained a few days before the onset of the meningeal symptoms. Serum therapy and the utilisation of an autogenous *B. coli* vaccine failed to influence the case favourably. S. A. K. WILSON.

A CASE OF INFLUENZAL MENINGITIS. C. VINCENT BOLAND, (107) *Lancet*, 1915, Sept. 25, p. 704.

THE patient was a baby, aged 4 months, who presented all the symptoms of cerebro-spinal meningitis. Lumber puncture, however, gave issue to a turbid fluid under slight pressure, with 1,000 leucocytes per cubic mm. (76 per cent. being polymorphs), and a positive Noguchi test. Stained films showed a small number of Gram-negative bacilli, which on culture gave a fine growth of *B. influenzæ*. He died seventeen days after the onset of the illness. A. NINIAN BRUCE.

MENINGITIS FROM MUMPS IN A CHILD. (Meningitis urliana (108) **en un nino.)** P. E. DUPRAT, *Rev. méd. del Uruguay*, 1915, xviii. p. 610.

A WHITE boy, aged 11 years, developed symptoms of meningitis during the acute stage of mumps. 30 c.c. of clear cerebro-spinal fluid were withdrawn under hypertension, and showed a marked lymphocytosis. Complete recovery took place in about three weeks from the onset. J. D. ROLLESTON.

THE DIAGNOSIS OF SO-CALLED PRIMARY TUBERCULOUS (109) **MENINGITIS. (Retention of urine in the adult male, without any apparent cause, as a new pathognomic sign.)** D. W. KEILLER MOODY, *Lancet*, 1916, Jan. 1, p. 23.

FOUR cases are described, the diagnosis in each being confirmed by autopsy. None of the patients complained of any pain although the bladder was distended, and none had any desire to pass urine. No stricture or enlarged prostate was present. Apparently sensation was absent. There was no paralysis of any of the abdominal muscles, although the sphincter reflex, causing contraction of the bladder, was absent. A. NINIAN BRUCE.

A CASE OF MULTIPLE VISCERAL HYDATID CYSTS (HEART, BRAIN, KIDNEYS). RUPTURE OF ONE OF THE HEART CYSTS IN THE LEFT AURICLE. DISCOVERY POST-MORTEM OF FREE DAUGHTER CYSTS IN THE LEFT CARDIAC CAVITIES. INTEGRITY OF THE LIVER AND LUNGS. (Un cas de kystes hydatiques viscéraux multiples (cœur, cerveau, reins). Rupture de l'un des kystes du cœur dans l'oreillette gauche. Constatation à l'autopsie de vésicules-filles libres à l'intérieur des cavités cardiaques gauches. Intégrité du foie et des poumons.) C. B. FORESTI and J. BONABA, *Rev. méd. del Uruguay*, 1915, xviii., p. 577.

(110)

A DETAILED and illustrated description of a case of which a *résumé* had been published elsewhere (*v. Review*, 1914, xii., p. 519).

J. D. ROLLESTON.

A SERIES OF CASES OF TRANSIENT APHASIA, HEMIPLEGIA, AND HEMIPARESIS, DUE TO ARTERIAL SPASM. J. GORDON SHARP, *Lancet*, 1915, ii., p. 863.

(111)

THIS condition is usually met with in those who have passed middle life and are the subjects of arterio-sclerosis, but is not confined to them, nor is it always accompanied by a high systolic blood-pressure. Alcohol, tobacco, excitement, and vitiated atmosphere are determining causes. Sharp records seven cases, five of which were in persons aged from 63 to 69, and two aged 25 and 36 respectively. Two of the cases were subjects of severe migraine, and of these one had a high systolic blood-pressure, the other not. Unlike some observers, Sharp has often found the extensor plantar reflex present in transient hemiplegia.

J. D. ROLLESTON.

CASE OF BRONCHO-PNEUMONIA COMPLICATED BY HEMIPLEGIA. V. M. METIVIER, *Lancet*, 1915, Aug. 7, p. 285.

(112)

A GIRL, aged 1¾ years, developed conjunctivitis and a cough on 23rd February. Broncho-pneumonia followed three days later, and her condition became very critical. On 5th March her left arm and leg were found to be paralysed, and the left side of the face was weak. On 6th April she developed measles. Recovery was slow. The hemiplegia was due to cerebral thrombosis, the endothelium of the small blood vessels being damaged by circulating toxins.

A. NINIAN BRUCE.

EXTRA-PYRAMIDAL MOTOR DISTURBANCES: A REPORT (113) OF A CASE WITH AUTOPSY. LENTICULO-RUBRO-CEREBELLO-OLIVARY DEGENERATION. J. H. W. RHEIN, *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 802.

A WOMAN, 43 years old, became paralytic in the left arm and leg at the age of 8 years, and remained in this condition until the time of her death.

At the time of death the symptoms consisted of paresis of the left arm and leg, contracture of the Achilles tendon, and spasticity of the knee joint, contracture at the shoulder joint, flexor contractures of the left elbow and wrist, retraction of the lower jaw, indistinct and spastic speech, moderately fine rhythmical tremor in the left leg and arm, and tremor of the jaw; an increased knee jerk, particularly on the left side, but no sign of Babinski and no clonus. The right side was unaffected.

At autopsy there was a lesion of the right putamen in its inferior and posterior portion; degeneration of the right ansa lenticularis, right red nucleus, left superior cerebellar peduncle, and left dentate nucleus.

The author holds that the case serves to show an anatomical connection between the dentate nucleus through the superior cerebellar peduncle with the contralateral red nucleus. Furthermore, he believes that these connections are the underlying pathological basis for extra-pyramidal motor disturbances.

The case is contrasted with Wilson's cases of bilateral lenticular degeneration, and a number of cases in the literature are reviewed.

D. K. HENDERSON.

ON TUMOURS OF THE TEMPORAL LOBE. (Gumma of the first (114) left temporal convolution). (Sui tumori del lobo temporale. (Gomma del prima giro temporale sinistro).) F. GIANNULI, *Riv. di Patol. nerv. e ment.*, 1915, xx., p. 657.

A RECORD of a personal case and a review of the literature. The writer's conclusions are as follows:—

1. Among tumours of the temporal lobe, gummata require special consideration, as they have an insidious onset and present symptoms resembling those of abscesses or subcortical hæmorrhages of the left temporal lobe, especially as regards aphasia and amnesia.

2. Cerebral gummata, when they have reached a certain size, are refractory to treatment or react to treatment very slowly.

3. Among the general symptoms of cerebral gummata which have reached a certain size, drowsiness should be borne in mind in addition to the general symptoms of endocranial tumours.

4. In tumours of the left temporal lobe, and especially those

of Mingazzini's first category, there are three kinds of localising symptoms to be distinguished—the neurological, the aphasic, and the amnesic.

5. The neurological symptoms include temporo-parietal headache, hemi-paresis on the opposite side to the tumour, Jacksonian attacks on the paretic side, predilection for the lateral decubitus, and decubitus on the same side as the tumour.

6. Besides the various commoner form of sensorial aphasia there is a form of *total verbal amnesia*, with a tendency to confabulation, and a constant repetition of phrases, combined with an unimpaired faculty for understanding and repeating words, and therefore with integrity of internal language.

7. The psychical symptoms are those commonly associated with the various forms of sensorial aphasia, or those which are accompanied by hallucinations, or they may be derived from the association of disturbances of speech and perception, as in the author's case, in which paranoid ideas with querulomania were associated with a permanent state of irritability partly due to hallucinations, and partly to an impotence of expression which had affected the function of language. J. D. ROLLESTON.

(115) **DISTORTIONS OF THE VISUAL FIELDS IN CASES OF PITUITARY TUMOUR.** ARNOLD JOSEFSON, *Nord. Med. Arkiv.* (Inre. Med.), 1916, Afd. II., Häft 1, Nr. 5.

THIS short paper consists of a claim to priority in regard to work on bitemporal hemianopsia in connection with pituitary tumours. The author points out that similar observations to those of Cushing and Walker (*v. Review*, 1915, xiii., p. 559) had been previously published by himself in 1903.

While Josefson is on safe ground in pointing out that the conclusions of these authors had been anticipated, his position is hardly so strong when he claims priority in discovering the early signs of bitemporal hemianopsia in 1903. Though possibly their full significance had not then been grasped, the characteristic features of the condition had been published by others, for instance by Doyne in 1895 and Uhthoff in 1897.

In reference to the early downward contraction of the upper temporal fields, it is hardly correct to say in February 1915 that "this new diagnostic sign from 1903 is forgotten in the literature." Stress was laid upon this sign in 1911 by Fisher, and it finds not infrequent mention in the journals of recent years.

It is interesting to note that the author finds that vision is retained last in the lower quadrants, and that he was the first (1901) to demonstrate enlargement of the sella turcica with the Roentgen rays. H. M. TRAQUAIR.

A CASE OF PINEAL TUMOUR. A. A. HIJMANS VAN DEN BERGH and (116) J. A. VAN HASSELT, *Nederl. Tijdschr. voor. Geneesk., Amsterdam*, 1913, i., p. 1271.

THE patient, a boy, was born at full time and had the usual diseases of childhood, according to his mother resembling other children. There was no suggestion of syphilis in the family history; the father died of alcoholic cirrhosis, the mother was probably phthisical. At the age of four the boy had a fainting fit without convulsions, and had a few more similar attacks during the next year. At five he had a sudden desire to pass water one night, and called to his mother, who found him unable to get out of bed as his legs were stiff and paretic; he lay almost motionless for four weeks, and then recovered spontaneously. From that time onwards he had occasional headaches, to which no special attention was paid until June 1910, when the headache was severe and continuous, and in August was accompanied by vomiting. It was noted that with these headaches there was great thirst. From October 1910 to February 1911 the boy was treated in hospital for headache and vomiting, and examination of the fundus showed œdema of the optic disc amounting to three diopters. The case was thought to be one of tuberculoma of the brain, and the patient was sent to a sanatorium for seven months. The headache and vomiting continued, however, and the patient was returned to hospital in August 1911, when he was nine years old. Here it was observed that the child had headaches lasting all day, with disturbances of the sensorium, and no recollection of the event next day. Some hours before the headache began there was always great thirst, leading to copious drinking and the passage of five or six litres of urine in a short time. During this stay in hospital the pulse was rapid, from 90 to 112; the temperature was usually normal; the nervous system was normal on examination, except for the fundus, which showed early optic atrophy in October 1911. The pupils were equal, round, and reacted to light and to accommodation; the hearing was good, the knee jerks were brisk, the plantar reflex was flexor. The urine was of low specific gravity, and free from sugar and albumin. The patient made no improvement; in the second half of January 1912 there was slight left facial palsy and ptosis, the right pupil was larger than the left, the internal recti and muscles raising and lowering the eyes were paralysed, and there had been complaint of diplopia for a week; there was no nystagmus. On 22nd January the child was comatose after a severe headache, his pulse was rapid, and he died next day. It was noted in October 1910 that the boy was unusually well developed for his age, 133·5 cm. in height, 36·7 kg. in weight, and 56 cm. round the head (this

circumference is given as 53·5 cm. after death), with a broad pelvis. The pelvis was of full adult size, the testes were those of a youth of seventeen or eighteen, the hair was well grown on the scrotum, pubes, and linea alba, erection and emission were not known to take place. The axillæ were hairless. A skiagram of the skull failed to reveal any abnormality of the sella turcica; the diagnosis of pineal tumour and internal hydrocephalus was made.

At the obduction the thyroid gland was found to be normal, the thymus seemed a little large, the tonsils and the lymphatic tissue at the back of the tongue and in the ileum were increased in size or amount, the two testes weighed 14 gm. The brain was large and showed flattening of the cerebral convolutions, the sella turcica appeared deepened, the optic chiasma and hypophysis looked normal; behind the chiasma and just above the stem of the hypophysis the floor of the third ventricle was swollen, while in front of the chiasma it was thinned. The brain was hardened in formol before cutting. On section the lateral ventricles were much enlarged; the third ventricle was distended and distorted by a knobby tumour the size and shape of a large chestnut, which pushed apart the optic thalami until their striæ corneæ were 4½ cm. apart, and the ventricle of the septum pellucidum was 1½ cm. wide. The tela choroidea of the third ventricle was pushed upwards and broadened, and its vessels were congested; many blood-clots protruded from the tumour, which fitted into excavations in the medial walls of the thalami; the foramina of Monro were widely dilated. Examined under the microscope the tumour proved to be a teratoma or embryoma, containing pineal tissue, pavement epithelium, lymphoid tissue, syncytial cells of chorionepithelioma malignum, hairs, sebaceous glands, nervous tissue, cylindrical epithelium, bone, cartilage, teeth, and cysts, some of which had folded walls with cylindrical or ciliated epithelium. After discussing its possible sources, the authors come to the conclusion that this tumour was pineal in origin, and quote other cases tabulated from the literature; no trace of the pineal body could be found in its normal situation, and the habenulæ could not be found on the tumour, no doubt having been destroyed by the pressure of its upper surface. Discussing the reason why the tumour should have grown in a forward direction, the authors quote Hempel's view that the front edge of the tentorium cerebelli may have prevented its growth in a backward direction. Microscopical examination of the testes showed active spermatogenesis in process; the prostate was very rich in glandular tissue. The authors ascribe the internal hydrocephalus to pressure exerted by the tumour on the two venæ cerebri internæ and the aqueduct of Sylvius; they give a discussion of the physiology and pathology of the pineal body based on the work of Raymond and Claude,

Marburg, and others. A photographic plate is given with reproductions of the patient, the brain, &c. A. J. JEX-BLAKE.

A CASE OF HYPERNEPHROMA WITH HYPERGENITALISM.
(117) A. A. HIJMANS VAN DEN BERGH, *Nederl. Tijdschr. voor Geneesk*, Amsterdam, 1915, ii., p. 2217, with plate (4 figs.).

THE patient, a well nourished girl, aged 3, was brought to hospital for an abdominal swelling. The greatest circumference of the abdomen was 70 cm., the navel was 17 cm. from the xiphoid cartilage, 12½ cm. from the os pubis. The distension was most marked in the left flank, where a large, hard, uneven tumour could be felt, extending across beyond the navel, rising and falling with respiration, free from ballottement on bimanual palpation. On inflation of the large intestine per rectum it was found that the gut passed in front of the tumour, and that the tumour was distinct from the spleen. The liver was thought to be enlarged; the kidneys could not be felt; the abdomen appeared to contain free fluid; nothing special was detected by rectal examination. Bronchitic sounds were heard in the lungs, and the left apex was dull; the left lung lay above the eighth dorsal spine behind, the right lung above the tenth. The child seemed ill generally, the temperature was irregularly febrile, the pulse rate 120-140. The most striking features about the girl were as follows:—The height was 101 cm. (106 cm. 18 days later), the weight 19·2 kg., in place of Quételet's normal figures of 88 cm. and 14 kg.; she was well-nourished but not fat, and not pigmented; she looked and spoke like an adolescent; the voice was that of a woman, a deep alto; the axillæ were hairless, the labia majora were covered with hairs 4 cm. long, and were large, while the clitoris was larger than that of an adult; nothing was known as to the occurrence of menstruation. The patient was quiet but not dull; the fundus was normal, and a skiagram showed a normal sella turcica. The urine contained leucocytes, hyaline casts, and a quarter part albumin per thousand, but no sugar. The blood examination showed a well marked secondary anæmia, with 50 per cent. of hæmoglobin, 4 million red cells, and 9,400 white per cub. mm., with 56 per cent. of polymorphs and 30 per cent. of small lymphocytes. The diagnosis of hypernephroma was made; operation was decided upon, though its dangers were recognised. The operation proved difficult; the tumour, with the left kidney attached to its lower pole, was removed; the patient did well at first, but died 36 hours later. The tumour weighed 2 kg., and measured $22 \times 16 \times 12$ cm., and was traversed by the renal vein. At the obduction the thymus and thyroid seemed normal; the

spleen weighed 170 gm.; the mesenteric glands were much swollen, and enlarged red-brown glands were found in the right supraclavicular fossa (nature?); a yellow lump the size of a pea was found in the anterior edge of the upper lobe of the left lung (nature?); the tonsils were large; the right suprarenal body was small and pale; the brain was normal. The tumour removed at operation was firm, the cut surface orange-yellow in colour, nodular and fibrous, free from renal tissue. Microscopically it was a carcinomatous hypernephroma, consisting of rows and columns of oval or rounded cells like those of the suprarenal zona fasciculata, separated by strands of thin fibrous tissue rich in vessels and dilated capillaries. The tumour cells were in places syncytial, in others unusually large and irregularly arranged with oval and pigmented nuclei; areas of cellular necrosis were also to be found. Sections stained with Sudan III. showed that the tumour cells were unusually rich in lipoids, particularly the larger cells; fatty droplets also occurred in the intercellular connective tissue. Van den Bergh tabulates seventeen other similar cases collected from the literature; fifteen of the eighteen patients were females; all but one were under 9 years of age; the hypernephroma was on the left side in twelve out of fifteen of the patients; twelve of the eighteen cases were recorded in the English literature.

A. J. JEX-BLAKE.

WHEN SHOULD THE CEREBRO-SPINAL FLUID BE EXAMINED
(118) **IN SYPHILIS? (Wann soll bei Syphilitikern die Spinal flüssigkeit untersucht werden?)** A. NEISSER, *Berl. klin. Woch.*, 1915, lii., p. 486.

1. EXAMINATION of the cerebro-spinal fluid is unnecessary as long as treatment has to be continued (on account of clinical symptoms or a positive serum reaction). The treatment should not be discontinued until the examination of the cerebro-spinal fluid has been negative, for in spite of the absence of clinical symptoms and a negative reaction in the blood, the spinal fluid may still be positive.

2. Some patients, in spite of energetic and repeated treatment, still show a positive reaction in the blood serum. The question of continuance of treatment is to be settled by the condition of the cerebro-spinal fluid. If it is negative, the possibility of disease of the central nervous system is so slight that Neisser considers further treatment unnecessary.

Every syphilitic patient, therefore, should have his cerebro-spinal fluid examined, though only for the settling of definite questions. The headache following the removal of the fluid may be diminished by injecting 10-20 c.c. of the patient's own serum,

with or without salvarsan, which has been injected intravenously on the previous day an hour before the blood has been withdrawn.

J. D. ROLLESTON.

NATURE AND QUANTITATIVE DETERMINATION OF THE
(119) **REDUCING SUBSTANCE IN NORMAL AND PATHOLOGIC CEREBRO-SPINAL FLUID.** OSCAR M. SCHLOSS and LOUIS C. SCHROEDER, *Amer. Journ. Dis. Child*, 1916, xi., Jan., p. 1.

THE reducing substance in cerebro-spinal fluid is a fermentable, dextrorotatory sugar, probably dextrose. In infants and children free from meningeal disease the cerebro-spinal fluid sugar ranges from 0·05 to 0·134 per cent. (dextrose), approximately the same figures which obtain for blood sugar. There is no decrease in the reducing power of the cerebro-spinal fluid in meningism. A large proportion of the cases of tuberculous meningitis show a decrease in the sugar content of the cerebro-spinal fluid at some stage of the disease. In a few cases, however, the sugar is normal at all times, or diminished but slightly. A decrease only is of diagnostic value.

A. NINIAN BRUCE.

TRICHINOSIS: REPORT OF A CASE WITH THE TRICHINA
(120) **LARVÆ IN THE SPINAL FLUID.** LEON BLOCH, *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2140 (1 fig.).

A MAN, aged 19, suffered from pains in the muscles of the arms and legs, with drenching sweats and fever. He became unable to move in bed without pain, and showed marked rigidity of the neck. Kernig's sign was positive, Babinski's sign was absent, and an excised piece of muscle from the biceps showed unencapsulated trichinæ. The eosinophils were 8 per cent. The spinal fluid was under high pressure, gave positive Nonne and Noguchi tests, and showed about a dozen actively motile trichina larvæ in the centrifuged specimen. The embryos were found in the blood. Vigorous catharsis seemed to have removed all the parasites from the intestinal tract, as the patient recovered completely.

A. NINIAN BRUCE.

CLINICAL RESULTS OF 1,000 INTRAVENOUS INJECTIONS OF
(121) **GALYL.** HAROLD SPENSE, *Lancet*, 1915, Dec. 11, p. 1292.

GALYL, one of several synthetic substitutes for salvarsan, is the invention of a French scientist, M. Mouneyrat. It is a light yellow powder, readily soluble in distilled water, neutral, and is used in precisely the same way as neosalvarsan.

Five cases are recorded. Galyl appears to be quite as satisfactory as salvarsan, although relapses may be more frequent.

No fatalities have yet been recorded, neither have any cases of undoubted arsenical intoxication been reported.

A. NINIAN BRUCE.

A CASE OF SYPHILITIC NEPHRITIS TREATED BY SALVARSAN.

(122) NORMAN MACDONALD, with remarks by SIDNEY PHILLIPS, *Lancet*, 1915, Sept. 25, p. 703.

A MAN, aged 24, developed syphilitic nephritis about the fifth month after infection. The onset was insidious, and without marked symptoms or derangement of health. The percentage of albumin was very high, and there was a great tendency to rapid and extensive dropsical effusion, which cleared up with unusual rapidity. The blood pressure was not raised, and the patient experienced a sense of well-being out of all proportion to his symptoms. As mercury and potassium iodide treatment failed, small doses of salvarsan were given intravenously, and distinct improvement took place in spite of the fact that albuminuria is usually said to increase the dangers of its administration. The doses were 0·3 gm., 0·4 gm., and 0·6 gm. A. NINIAN BRUCE.

A PATHOLOGICAL STUDY OF SYPHILITIC AORTITIS AND ITS SEROLOGY.

(123) JOHN H. LARKIN and I. J. LEVY, *Journ. Exp. Med.*, 1916, xxiii., Jan., pp. 24-38 (7 figs.).

SYPHILITIC aortitis is a productive inflammatory process, the earliest and most constant feature of which is a perivascular round cell infiltration in the adventitia. The typical gross picture of luetic aortitis is often obscured by a superimposed, diffuse atherosclerosis. In the early cases the aorta appears fairly normal, presenting only the characteristic histological changes. A pure aortic insufficient valve, with the exception of an infectious endocarditis, is always luetic. Cardiac hypertrophy is not a complication of luetic aortitis. When present it is usually associated with a nephritis.

The demonstration of *Spirochæta pallida*, even in advanced specimens of syphilitic aortas, is doubtful. An antigen, prepared from alcoholic extract of guinea-pig heart with the original Wassermann technique, should be preferred in diagnosing luetic aortitis. Positive complement fixations in patients suffering with syphilis for a period of about fifteen years or longer suggest the probability, at least, of histological luetic changes in the aorta of 80 to 90 per cent. of the cases. 60 per cent. of these die from aortitis. About 90 per cent. of patients suffering with aortitis give positive Wassermann reactions.

A. NINIAN BRUCE.

A SEVERE CASE OF SYPHILIS WITH VERY EARLY INVOLVE-
(124) **MENT OF THE NERVE CENTRES. (Sobre un caso grave de syphilis com manifestaçoes precossimas para os centros nervosos.)** E. R ALVES, *Ann. Paul de med. e cir.*, 1915, Nos. 2, 3, 4 (L. P. Barretto Jubilee Number), p. 150.

A MAN, aged 32, without any nervous antecedents, contracted syphilis. Twenty days after the appearance of the chancre, Alves received an urgent call to the patient's house, and found him suffering from intense headache, vomiting, tinnitus, especially in the left ear, left ptosis, dilatation of the left pupil, with feeble reaction to light, deviation of the mouth, fibrillary contractions of the muscles of the neck and left side of the face, pain in the left arm, and formication in the fingers of the left hand. The mind was clear. The symptoms disappeared after treatment with neosalvarsan, associated with biniodide of mercury, but a second attack and a third of greater violence occurred some months later as the result of the patient's neglect. Recovery followed treatment by neosalvarsan. Alves attributes the symptoms to sclero-gummatous lesions at the base of the brain. J. D. ROLLESTON.

FEAR AND DISEASE. E. T. JENSON, *Lancet*, 1915, Jan. 30, p.
(125) 231.

THE author's point is that fear, by paralysing the hollow viscera, allows the passage of toxic substances through the intestinal mucous membrane, and may thus be a fundamental factor in causing alimentary toxæmia.

By "fear" he includes "broadly all such emotions as may contain an element of fear, such as anxiety, sorrow (a present loss, with fear of unhappiness in the future), overwork, anger (fear of another), exaggerated self-consciousness (fear of criticism), and pain, with its milder varieties of malaise and fatigue." Fear will commonly cause pallor, with a feeling of faintness, while gastro-intestinal and vesical disturbances frequently ensue. This is due to a vaso-constrictor paralysis, which causes (1) an increase in the absorption area of the inner intestinal surface; (2) an increase in the absorbing area of the blood-vessel wall; (3) a thinning of the blood-vessel wall; (4) a thinning of the intestinal wall; (5) they contain more blood; (6) the blood stream is slowed. All these six factors tend to favour the absorption of the intestinal contents into the blood, and create a psycho-physical vicious circle.

A NINIAN BRUCE.

ALCOHOLIC POLYNEURITIS WITH UNILATERAL DIAPHRAG-
(126) **MATIC AND LARYNGEAL PARALYSIS. (Polyneuritis alcoholica mit einseitiger Zwerchfell- und Stimmbandlähmung.)** W. LÖFFLER, *Deutsch. med. Woch.*, 1915, xli., p. 1308.

A RECORD of a case in a man, aged 29, in whom paralysis of the left phrenic and left recurrent laryngeal nerves was associated with paralysis of the left arm and weakness in both legs. Electrical examination showed R. D. in the left musculo-spiral, and both peroneal nerves. Treatment consisted in complete withdrawal of alcohol, pine baths, passive movements, massage, and electrical stimulation of the paralysed nerves of the extremities. Rapid recovery took place; the diaphragmatic paralysis cleared up first without any local treatment. J. D. ROLLESTON.

MALARIAL POLYNEURITIS AND BERI-BERI. (Polinevrite
(127) **palustre e beri-beri.)** J. A. CAJAZEIRA, *Archiv. Brasil. de Med.*, 1915, v., p. 252.

THE writer denies the existence of malarial polyneuritis, and attributes polyneuritis in malarial subjects to alcoholic intoxication or to improper feeding, which gives rise to beri-beri.

J. D. ROLLESTON.

THE NERVOUS PATIENT. CHARLES P. EMERSON, *Bull. Johns Hop.*
(128) *Hosp.*, 1915, xxvi., May, p. 133.

AN interesting but somewhat formal paper dealing with the causes and symptoms of neurasthenic states and their treatment.

D. K. HENDERSON.

SCLERODERMIA OCCURRING IN A CASE OF MYXŒDEMA
(129) **WHILE UNDER THYROID TREATMENT.** J. H. SEQUEIRA, *Proc. Roy. Soc. Med.*, 1916, ix., Jan. (Dermatol. Sect.), p. 41.

THE patient was a woman who developed myxœdema about the age of 42. She was treated for fifteen years by thyroid extract, and at the age of 56 showed no signs of the disease.

The interest of the case lies in the fact that during the last year she had developed sclerodermia, a disease for which thyroid is strongly recommended as a remedy. An area of sclerodermia was present from below the middle of each leg to just above the instep. The Wassermann reaction was negative.

A. NINIAN BRUCE.

INFANTILE TETANY. SPENCER SHEILL, *Dublin Journ. Med. Sci.*, (130) 1916, Series 3, No. 529, Jan., p. 8.

INFANTILE tetany may be defined as an affection whose principal feature is tonic spasm of the face and extremities, which may be intermittent or continuous.

Among the predisposing causes may be mentioned:—

1. The irritability of the infantile nervous system, which disappears as increasing age develops the higher centres.
2. Inherited neurotic tendencies.
3. Rickets, *i.e.*, malnutrition of the brain in common with that of the rest of the body.

The exciting causes are:—

1. Local disease or injury to the brain or its membranes, tumours, intra-cranial hæmorrhage, and meningitis.
2. Onset of diseases, *e.g.*, pneumonia.
3. Peripheral irritation, such as gastro-intestinal disorders, teething, &c.

Reference is made to three cases. A. NINIAN BRUCE.

PSYCHIATRY.

SOMATIC CHARACTERISTICS OF GENERAL PARETICS. DONALD (131) GREGG, *Boston Med. and Surg. Journ.*, April 8, 1915, clxxii., pp. 519-532.

Summary of Conclusions.—The carnivorous type of individual is especially susceptible to nervous disease. A series of one hundred cases of general paralysis of the insane were found to be of this carnivorous type. Author offers this susceptibility of type to syphilis as an explanation of the fact that so few syphilitics develop general paresis. WALTER B. SWIFT.

PROTEOLYTIC FERMENTS OF THE BLOOD SERUM IN TABES (132) **DORSALIS AND GENERAL PARESIS.** FRED. HOWARD FALLS, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 1, p. 22.

THE ferment activity of the blood serum is increased above the normal in tabes dorsalis and general paralysis. This increase is greater in general paresis than in tabes dorsalis.

A. NINIAN BRUCE.

THE ONSET OF GENERAL PARALYSIS. CHARLES RICKSHER, *Bull.*
(133) *Johns Hop. Hosp.*, 1915, xxvi., May, p. 174.

A REPORT of two cases, in both of whom there was an absence of definite physical signs, and in whom the mental picture was atypical. D. K. HENDERSON.

STATISTICAL STUDY OF HALLUCINATIONS IN THE MANIC-
(134) **DEPRESSIVE PSYCHOSES.** JOHN E. LIND, *Journ. Nerv. and Ment. Dis.*, xlii., 1915, Nov., p. 727.

Two hundred and forty-four cases of manic-depressive psychoses have been studied. Tables are given showing the frequency and type of hallucinations in men and women, both white and coloured. In general, the conclusion arrived at is that hallucinations occur somewhat more frequently in the female than in the male, and about twice as frequently in the negro as in the white. About one-sixth of all white manics and one-third of all coloured manics have hallucinations. D. K. HENDERSON.

A STUDY OF THE BENIGN PSYCHOSES. AUGUST HOCH, *Bull.*
(135) *Johns Hop. Hosp.*, 1915, xxvi., May, p. 165.

A SUGGESTIVE paper, formulating a conception of the manic-depressive psychoses from the point of view of a dynamic psychology. It is clearly explained how infantile motives are among the deepest repressed strivings, and how, when it is stated that there is a sexual cause in every neurosis, that this does not imply a sexual cause in the adult sense, but in the sense that the cause lies in the imperfect instinct development of the individual. It is exceedingly important to understand the dynamic force of infantile motives, and to realise that such motives must not be estimated from the standpoint of adult logical thinking. "The psychosis does not think logically, but autistically."

In studying the relationship of the ideas expressed by the patient to the emotional reaction, it was found that certain types of content were typical for certain types of reactions, and that there is both an infantile and an adult content. To illustrate this, certain cases of retarded depression in women have been studied, in whom the precipitating cause was the death of the mother. It was found that the precipitating causes did not act through their superficial manifest meaning, but through the significance they have for the unconscious wish life, "inflating the infantile unconscious desires." It was concluded that one of the

chief functions of retarded depressions must be that of repression of infantile unconscious strivings.

In manic states it was found that the precipitating causes represented essentially fulfilments of unconscious wishes. The content of manic states was found to consist of two main types, a religious one and an erotic one, and it was then seen that what characterised the content of the benign manic states was their adult level. Stated more briefly, the point of view which the author wishes to bring forward is the probability that, when depressions are produced by precipitating causes which represent a fulfilment of an unconscious wish, this is always on an infantile level; whereas the wish fulfilment contained in the precipitating causes of a manic attack are on an adult level.

D. K. HENDERSON.

A CASE OF ACUTE MELANCHOLIA TREATED BY BLOOD-LETTING. F. LUCAS BENHAM, *Lancet*, 1915, Aug. 7, p. 548.
(136)

A MAN, aged 25 years, whose father had been insane, became very depressed, mentally dull and slow, with delusions of terror and suicidal impulses. He became worse with bromide. He was then bled from the arm (about 20 ounces), and immediately became brighter. After a slight relapse, he made a good recovery, and later enlisted.

A. NINIAN BRUCE.

MENTAL DISTURBANCES IN THE FEEBLE-MINDED. W. N. BULLARD, *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 818.
(137)

A SHORT paper emphasising especially the acute, transitory, violent excitements occurring in the feeble-minded.

D. K. HENDERSON.

EXTRA-MURAL PSYCHIATRY IN BALTIMORE. W. B. CORNELL *Bull. Johns Hop. Hosp.*, 1915, xxvi., May, p. 164.
(138)

THE title of this paper is rather misleading, as it has nothing to do with the teaching of psychiatry, but refers simply to the preventive measures which may be adopted either before the patient enters a hospital for mental diseases, or at the time of his discharge.

After-care supervision has become an essential for every such hospital, not only because many convalescent patients can be discharged with safety much sooner than they otherwise would, but they can also be safeguarded in many ways; the result of such

a system is a large financial saving to the State, because relapses are often prevented.

In regard to preventive measures, a Mental Hygiene Society has been formed in Baltimore to which cases are referred from the other charitable agencies, from the court, &c., for advice in regard to their mental condition and treatment. D. K. HENDERSON.

THE ABSENCE OF PROPER FACILITIES FOR THE TREATMENT
(139) **OF MENTAL DISORDERS IN THEIR EARLY STAGES.**
BEDFORD PIERCE, *Brit. Med. Journ.*, 1916, Jan. 8, p. 41.

THE subject was introduced by alluding to the report of the Select Committee of the House of Commons in 1815, which inquired into the state of madhouses, and it was pointed out that in spite of the exhaustion of the country by the Napoleonic wars, on the Friday before the battle of Waterloo this Select Committee considered the advisability of spending large sums of money in the establishment of new institutions for the insane. The opinion was expressed that "unless the British character during the last century has seriously altered, it will not be long before the country will be willing to give attention to social questions . . . the lull of political controversy would seem to afford a singularly opportune time for considering whether any alteration in the law is required in the interests of persons threatened with mental disease."

After alluding briefly to the work done in this direction by the British Medical Association, the Medico-Psychological Association, and the Medico-Legal Society, the defects of the present system were briefly stated.

Reference was next made to Dr Maudsley's gift to the London County Council, and existing clinics were described—Dr Ziehen's in Berlin, the Psychopathic Hospital in Boston, Henry Phipp's clinic at Baltimore, the Poor Law Hospitals in Glasgow and London, and the Lady Chichester Hospital Home near Brighton, and some account given of the valuable service these and similar institutions have rendered. The Military Hospital at Moss-side, Maghull, now under the care of Major Rows, was also appreciatively referred to.

In considering the problem of securing effective treatment for those in a position to pay for it, reference was made to the homes now available, and how inadequate they are in many cases.

The prejudices against asylums were discussed, and attributed in part to unreasoned traditional beliefs and a survival of the superstition that mental disease is something uncanny, mysterious, supernatural, and in reality something evil.

Some attention is given to the prejudicial effect of certificates in certain cases, and sympathy expressed with the strong objection felt to the formal certification of insanity, especially recent undeveloped cases. Cases to illustrate this are given.

Besides the establishment of clinics in association with general hospitals and Universities, it was recommended that there should be legal recognition of a class of patients intermediate between voluntary boarders and certified patients. These patients might be termed "Notified" patients, as the facts of every case would be notified to the Board of Control. They could legally be detained for a strictly limited period in homes, hospitals, or in institutions for the insane, approved by the Board, and regularly visited by its members. It was urged that if there were no concealment of facts there would be no danger of abuse.

This alteration in the law would prevent evasion, and the illegal detention in lodgings and other unsuitable places, and at the same time secure effective treatment for a large number of cases which now are allowed to drift almost without treatment into manifest insanity. AUTHOR'S ABSTRACT.

BORDER-LINE CASES OF MENTAL DEFECT, WITH SPECIAL
(140) **REFERENCE TO HYSTERICAL SYMPTOMS.** CHESTER C. BECKLEY, *Boston Med. and Surg. Journ.*, April 8, 1915, clxxii., pp. 510-519.

BECKLEY, after nine careful reports of cases, concludes: Border-line cases are a prolific source of venereal disease; their children will be as abnormal as the mothers; they do not belong to a reform school, for they are unreformable; they do not belong to insane hospitals or feeble-minded schools; and finally, much expense would be saved the State by committing this class to custodial care. WALTER B. SWIFT.

NOTE ON THE RECENT EXTENSION OF OUT-PATIENT WORK
(141) **IN MASSACHUSETTS HOSPITALS FOR THE INSANE.** A. WARREN STEARNS, *Boston Med. and Surg. Journ.*, April 15, 1915, clxxii., pp. 553-555.

MASSACHUSETTS again leading in care for the insane by establishing out-patient departments. One at Massachusetts School for Feeble-Minded began twenty-five years ago. On January 1, 1913, the Psychopathic Hospital opened the first full-fledged out-patient department in any State insane hospital. In August

1914 the Board of Insanity decided to make this a State-wide movement at the suggestion of Dr Stearns. The work included clinic, after-care, family care, and mental hygiene. Twenty-six clinics throughout the state have been established by Dr Stearns.

WALTER B. SWIFT.

TREATMENT.

(142) **PROLONGED PHARMACOLOGICAL HYPNOSIS AND ITS APPLICATION FOR THE CURE OF SOME PSYCHOSES.** **(L'ipnosi farmacologica prolungata e sua applicazione per la cura di alcune psicopatie.)** G. EPIFANIO, *Riv. di Patol. nerv. e ment.*, 1915, xx., p. 273.

PHARMACOLOGICAL hypnosis consists in the administration of an hypnotic for several days in succession in doses so regulated as to induce a more or less continuous sleep. The term "hypnosis" is preferred to "narcosis," which implies abolition of sensibility and complete dulling of the sensorium, whereas in hypnosis consciousness can be awakened and the general sensibility is almost intact. In psychoses due to infection, in febrile delirium, and delirium tremens, a profound sleep often marks the end of the mental disturbance. The writer accordingly thought of provoking artificially a sleep of long duration as a means of curing some forms of mental disease.

He records ten cases in which he administered subcutaneous injections of luminal-sodium in doses of 20-80 grammes for 5-12 days in succession. His results were as follows:—During the treatment and the following days there was an increase in body weight. Permanent recovery maintained up to the time of writing, *i.e.*, for about two years, occurred in—(1) A form of dementia præcox with severe but early symptoms; (2) in an undetermined case resembling in some respects dementia præcox and in others manic-depressive psychosis; (3) a case of pure mania in a young woman; (4) a case of manic-depressive psychosis.

No improvement occurred in a severe case of old hebephrenia and in a cataleptic and stuporous case with advanced dementia. In a very severe catatonic form resolution of the catatonia took place, but dementia persisted. In a grave degenerative form with a bad family history there was only slight improvement.

Epifanio discusses the action of prolonged sleep on consciousness, memory, emotions, ideation, volition, &c. The most important result was the disappearance of hallucinations. No bad results occurred from the use of the drug. J. D. ROLLESTON.

BRAIN LIPOID AS A HÆMOSTATIC. ARTHUR D. HIRSCHFELDER, (143) *Lancet*, 1915, Sept. 4, p. 542.

HOWELL has shown that the so-called fibrin ferment is not a true ferment, but a lipoid substance, which seems identical with the diphosphatide, *kephalin*, first isolated from the brain by Thudichum. The fibrin ferment has proved of much use for stopping bleeding, and the author thought that a similar usefulness might be found for lipoids derived from the brain, especially as these are present in relatively large quantities.

Experiments with kephalin obtained from ox brain confirmed this, and it is suggested that it could be prepared sterilely and given to soldiers to use as a first-aid dressing for wounds.

A. NINIAN BRUCE.

THE USE OF ELECTRICAL METHODS AND THE VALUE OF 144) **RADIOGRAPHY IN THE DIAGNOSIS AND TREATMENT OF NEUROLOGICAL CONDITIONS.** H. LEWIS JONES, *Proc. Roy. Soc. Med.*, 1914, March (Electro-Therap. Sect.), p. 35.

IN the treatment of paralysed muscles the treatment must be a rhythmically varying one, with a rate of about fifteen periods of action and of rest per minute. Next the current should be used for longer periods and of greater strengths than has hitherto been usual; and lastly, there is an advantage in using condensor discharges instead of induction-coil currents, because they are more agreeable to the patient.

The importance of utilising ionic methods applied to the lesion of the nerve-trunk is of considerable importance; mere stimulation of the muscles is not enough.

A. NINIAN BRUCE.

Reviews

TEXT-BOOK OF MENTAL DISEASES. (Trattato delle Malattie (145) **Mentali.)** EUGENIO TANZI and ERNESTO LUGARO. Second edition, entirely rewritten. Vol. I. Pp. xv.+672, with 146 figures, some coloured. 1914. Price L. 20. Vol. II. Pp. viii.+846, with 145 figures. 1916. Società Editrice Libraria, Milano. Price (both vols.), L. 45.

THE first edition of this most important text-book of mental diseases was reviewed by us eleven years ago (*v. Review*, 1905, iii., p. 150). In this, the second edition, Prof. Tanzi has had the

collaboration of Prof. Lugaro of the psychiatrical clinique of Turin University, and the result has been the production of a work of quite outstanding merit, and as we remarked in our previous review, since "it reflects the achievements of the school from which it comes, is therefore no ordinary event in the progress of psychiatry." It has been divided into two large volumes, the first of which appeared in 1914, the second has only just been published.

The first volume deals at great length with the general considerations and fundamental questions necessary for the understanding of mental diseases. It is divided into thirteen chapters. The first chapter discusses the seat of the psychical processes, and gives a general account of the anatomical structure of the brain, without, however, including much of J. S. Bolton's recent work. Chapter II. deals with the cause of mental diseases, from the points of view of external causes, (*a*) physical, (*b*) psychical and social; and internal causes, (*a*) degeneration, (*b*) heredity, and (*c*) predisposition. A most valuable chapter then follows upon pathological anatomy, the changes in the nerve cell and in the neuroglia being fully illustrated and described at length. A series of chapters follow (*a*) upon the senses and perceptions, including the mechanism of hallucinations and pseudo-hallucinations; (*b*) on memory, physiological and pathological; (*c*) on thought, physiological and pathological, obsessions and delirium; (*d*) on emotions; (*e*) on instincts; (*f*) on the will, defective, impulsive, and suggestibility; (*g*) on expression, mimicing, speaking, writing, aphasia, agraphia, and alexia. The psychical examination and the physical examination is then treated in separate chapters, and the volume closes with a criticism of the classifications of mental diseases, and gives the author's scheme, with which the second volume deals in detail.

The classification of mental diseases used in the first edition was given in our previous review, and was based essentially upon etiology. It is used also here with various additions, the second volume being entirely devoted to the full description and understanding of the individual forms of mental disease. The symptoms, course, pathological anatomy, clinical forms, etiology, progress, and treatment of each type of mental disease is systematically described. One of the most interesting chapters is the third, which is devoted to pellagra. Some interesting points of its earlier history are given. The distribution of the disease in Italy per 1,000 of the population during 1881, 1899, and 1910 is shown in three maps. In the triennial period 1890-92 the number of deaths was 12,286, in the year 1898 it was 3,987, in 1904 it had fallen to 2,363, in 1909 it was 1,420, and in 1911, 1,222. In a work of such general excellence it is difficult to pick out any

particular chapter for praise, but the chapters upon the infantile, adult, and senile encephalopathies are specially worthy of note. The number of diseases included under the first two of these headings is very large, and includes disseminated sclerosis, cerebral tumour, cerebral cysticercus, Huntington's chorea, and many others.

These two volumes form a contribution to psychiatry of outstanding value. They are characterised by a definiteness of expression and an independence of judgment which will raise still higher the standard and reputation which Italian psychiatry has already attained. The authors have the gift of explaining their meaning with a quite unusual clearness, and as they are here dealing with a subject of such intricacy as modern psychiatry, and are regarding it from a special attitude of their own, such a gift is invaluable. The tendency of Professor Tanzi in his first edition was in many places to be ahead of his time, and it is very remarkable how, during the last ten years, many of the conclusions arrived at in the earlier edition are being borne out in the recent progress of psychiatry. Viewed from all points, these two volumes form so valuable an addition to modern psychiatry that their influence cannot but be considerable, and we trust that before long they may also find an English translator who will make their contents available to those who are not able to read the original Italian.

THE THEORY OF PSYCHOANALYSIS. C. G. JUNG (of Zurich). (146) Pp. 135. Nervous and Mental Disease Monograph Series, No. 19. Nervous and Mental Disease Publishing Co., New York, 1915. Pr. $1·50.

THE theory of psychoanalysis is regarded by Jung from a different viewpoint from Freud. The attitude adopted by both, however, has so much in common, that it is a matter of some difficulty for anyone who has not devoted himself to a special study of the subject to understand at all clearly the fundamental points of this difference.

The views of Freud have been stated in his different works, and are now well known. It is, therefore, of considerable importance to have presented to us here a clear statement of the position of Jung, who has published in this form the lectures which he delivered at the "Extension Course" at Fordham University, New York, in September 1912, at the invitation of Dr S. E. Jelliffe. Since then Jung has made further contributions to this subject (*c. Review*, 1915, xiii., pp. 60, 99, 440). We have here, however,

an account of his attitude to the problem of psychoanalysis at this earlier date.

Charcot, probably under the influence of Page's theory of nervous shock, elaborated the "traumatic theory" of hysteria. The emotion provoked by the shock caused a momentary complete paralysis of will-power, during which the remembrance of the trauma could be fixed as an auto-suggestion. This conception gives us the original theory of psychoanalysis. The question then arose whether a similar mechanism was also present in those cases of hysteria which could not be called traumatic. Freud, a pupil of Charcot, showed that the same trauma element was to be found in these latter cases, and considered that it had an etiological value. The shock or trauma provokes a certain excitation which, under normal circumstances, finds a natural outlet. In hysteria the excitation only partially finds a natural outlet, a partial retention takes place, and this transmitted by the mechanism of conversion into "physical" symptoms. Therapy consisted in finding a means by which these retained emotions could be brought to a mode of expression, thereby setting free from the symptoms that amount of repressed and converted feeling. The method used was an analysis of the symptoms.

Freud, however, introduced a conception which was to extend far beyond the limits of the shock-theory. This conception was the hypothesis of repression, *i.e.*, the psychic mechanism of the re-transportation of a conscious thought into the unconscious sphere. An entirely different method then became necessary to call again into consciousness those traumatic events long since forgotten. Freud was the first also who discovered that a certain sexual element was connected with the shock. This sexual element is unconscious, and it is to this that the traumatic effect is generally due. As the analysis progressed the roots of hysterical symptoms were found in childhood, and hence arose the theory of sexual trauma in childhood. The theory of sexual trauma next had to be abandoned, as in general the shock is not even real, and the infantile sexual phantasy theory took its place, the condition being regarded as arising not from without but from within.

The whole conception is here carefully explained by Jung under the headings of infantile sexuality, conception of libido, etiological significance of the infantile sexuality, the unconscious, the dream, the content of the unconscious, the etiology of the neuroses, and an analysis of a typical case is given in some detail in the last chapter.

THE NURSING AND CARE OF THE NERVOUS AND THE INSANE. CHARLES K. MILLS. Third edition, revised by the author, assisted by N. S. Yawger. Pp. 142, with 12 figs. J. B. Lippincott Co., Philadelphia and London. Pr. 5s. net.
(147)

THE contents of this little book are the substance of a course of lectures delivered at the Training School for Nurses of the Philadelphia Hospital, and later at the Women's Hospital Training School for Nurses at Philadelphia. In no class of case is it more important for a nurse or companion to have good principles of action and clear notions of practice than among patients suffering from nervous or mental affections. Many of these cases require prolonged treatment, much of which must necessarily be carried out in the absence of the physician. It is therefore of extreme importance that the nurse be in sympathy with the attitude of the physician in charge of the case, and that she have an intelligent understanding of the methods of treatment adopted.

The book is divided into five chapters. The first is devoted to a consideration of some of the personal qualities and qualifications required from nurses for nervous cases, and to certain miscellaneous matters in connection with nervous nursing. In the second and third chapters massage, active and passive movements, sponging, hot and cold packs, salt rub, and baths are dealt with. The fourth chapter discusses electricity. "My view is that in a certain limited number of cases, under the direction of the doctor, the well-trained nurse may be entirely competent to use electricity." The description is limited to faradic and galvanic electricity. The fifth chapter is concerned with the nursing and care of the insane. The rules for bathing which are in force at the State Hospital for the Insane, Norristown, the most important rules used in the female and male departments of the Philadelphia Hospital for the Insane, the rules and regulations in force at the Craig Colony for Epileptics at Sonyea, N.Y., and in other places, are included, so that the book is not only of use to those who are beginning nursing, but also to those who wish to control the management and organisation of nursing staffs.

The descriptions given are not too technical, and do not presuppose any great knowledge of anatomy or physiology on the part of the reader. Much useful information is included, and we have no hesitation in recommending the book as one likely to be helpful, not only to the beginner, but to anyone wishing to make a study of nervous cases from the nursing point of view.

INSTINCT AND INTELLIGENCE. N. C. MACNAMARA, F.R.C.S. (148) Pp. 216, with 17 figs. Oxford Medical Publications. Henry Frowde and Hodder & Stoughton, London, 1915. Pr. 6s. net.

MR MACNAMARA gives us here a most interesting and readable account of a most interesting subject. He considers that the tendency at present is to exaggerate the importance of training the intellect, and to overlook the fact that each individual possesses certain instinctive qualities which to a large extent determine his behaviour throughout life. Instinctive action is based primarily upon racial experience, and is dependent upon inherited nerve structure; intelligent action, on the other hand, is based upon individual experience. The former qualities cannot be eradicated, but may be favourably modified by appropriate training. Education has thus first and foremost to deal with the proper development of the nervous substance of that part of the brain, the orderly working of which is essential for the occurrence of instinctive and intellectual phenomena.

He then proceeds to show that, as we ascend the animal kingdom, the increase in the complexity of the structure of the central nervous system is associated with an increase in the psycho-physiological functions of the animal. He traces the development of the nervous system from the response of the amœba to stimuli, through the medusoids with their "eye-spots" and other evidence of nervous differentiation, the star-fish with their central nerve-ring round the mouth and peripheral nerves to the arms, the ganglionated chain of the earthworms, the primitive brain of insects and crustaceans, to the evolution of the basal ganglia. From this the gradual growth of the neopallium in vertebrates is sketched to its final culmination in the human brain. "The basal ganglia constitute the basic substance on the working of which instinctive character or behaviour mainly depends," while the intellectual processes depend upon the development and working of the association areas of the neopallium. This part of the brain, being of later phylogenetic evolution than its more stable instinctive elements, under the action of appropriate stimuli, more readily undergoes variations and mutations of structure.

The present methods of education tend to lay too little stress upon the necessity of training the instinctive faculties, which have a definite physical basis, and upon which the intellectual faculties are, as it were, superimposed, the two working together smoothly and harmoniously. Some suggestions are given towards the end of the book as to how this might be accomplished in actual practice, and a short appendix follows upon the origin of structural variations in living organisms, and their adaptability to the environment.

VICIOUS CIRCLES IN SOCIOLOGY AND THEIR TREATMENT.
(149) J. B. HURRY. Pp. 34, with 2 plates. J. and A. Churchill, London, 1915. Pr. 2s. net.

DR HURRY is already well known on account of his previous work on vicious circles, or as he prefers to call them, vicious spirals (*v. Review*, 1915, xiii., p. 81). He here points out that many social evils form vicious circles, and that for those who are engaged in such study it is essential to analyse these evils into their constituent factors, and thus understand how and where the circle can best be broken. For instance, inebriety gives rise to dyspepsia, which in its turn causes misery and further inebriety. Crime is responsible for loss of employment, causing loss of means of subsistence and further crime. Disease produces incapacity for work, and leads to removal to a slum where the conditions are insanitary, and further disease is encouraged. Poverty is followed by malnutrition, with resulting debility and diminished earning power, and hence further poverty.

The style corresponds to that of previous works, namely, a collection of quotations from the works of other authors, with references, and concludes with a chapter upon the means of breaking of the circle. It is easily and quickly read, and should prove of interest and value to many who have not grasped the significance of the vicious circle.

REPORTS OF THE CLINICAL CONFERENCES OF THE NEURO-
(150) **LOGICAL INSTITUTE OF NEW YORK.** 1914-1915.

THIS monograph consists of a collection of forty-eight papers, all of importance, all purely neurological, all of which have already been published before, and all of which had been brought before the medical staff at their clinical conferences. The Neurological Institute of New York is to be congratulated upon the high standard of the work which has been collected together here, and which forms a valuable addition to neurological literature.

Review

of

Neurology and Psychiatry

Original Articles

THE POSSIBILITY OF VOICE INHERITANCE.

By WALTER B. SWIFT, M.D.,

In charge of the Voice Clinic, Boston State Hospital, Psychopathic Department, Boston, Massachusetts;

Assistant to the Laryngological Department Special Clinic for Speech Disorder, Massachusetts General Hospital.

THE inheritance of exceptional musical ability is familiar enough. For example, in "Eugenics: Twelve University Lectures" (3), on p. 124, I find the statement that the "Bach family had twenty eminent composers and two score less eminent ones." But in such cases it is obviously the ability to profit by long practice and drill that is inherited rather than any peculiarity of the physical and nervous organism. The present discussion has nothing to do with training, or even with the inheritance of unusual intelligence. It touches the field of eugenics on the physical side alone.

The possibility of voice inheritance rests solely upon the question as to whether those structures upon which vocal quality depends are themselves heritable. If I can show that the structures are inherited, and that vocal quality is determined by them, I shall have proved at least the possibility of voice inheritance. And I think it can be established beyond reasonable doubt that just as extra fingers, colour of hair, complexion, form

and size of the body, are transferred from parent to child, so the structures that condition vocal quality may be transferred.

To establish upon a scientific basis the heritability of vocal quality, I shall first have to prove in as many ways as possible that the material forms and physical structures which underlie the vocal form are actually inherited. Then I must show that the voice is really dependent in an absolute way upon these structures. In treating this subject I shall employ evidence from three different sources, viz., the evidence in genetic literature with reference to structural inheritance, the high cheek bone of the American Indian, the inheritance of skull forms as determining vocal quality in the lower animals.

1. References in Genetic Literature to Determination of Bone Structure by Heredity.

In H. E. Walter's "Genetics: An Introduction to the Study of Heredity" (1), I have found no reference that can be interpreted as evidence of individual variation in bones and bone cavities. W. E. Castle, however, in an earlier publication, makes a very definite reference to this matter. In regard to inheritance of hands he says: "Half the offspring were short-bodied and with short fingers and toes." In "Eugenics: Twelve University Lectures" (3), I find several references. On p. 6 Davenport says: "Short stature and slenderness are more or less probably inherited as positive characters." Here, then, short stature, which of course includes bony structure, is mentioned in much the same way as by Castle. In this work achondroplasia, syndactylism, polydactylism, and brachydactylism are all said to be heritable. Jordan (3) says that "men are born bound." On p. 162 of the same volume, Webber says: "Many cases of physical deformity, such as club foot, brachydactyly, syndactyly, extra fingers and toes, are considered in a considerable degree inheritable, as are also peculiar forms of various organs."

In his book entitled "The Kallikak Family" (4), Goddard hardly mentions the phase of inheritance I am discussing. In a casual perusal of his latest work on the causes of feeble-mindedness, I have found no reference to the subject.

I am still seeking for further evidence in the literature upon

genetics and cacogenetics to support my claim. Any references that my readers can furnish will be gladly received.

2. Inheritance of the High Cheek Bone in Indians.

It is well known that the high cheek bone is a constant characteristic of the American Indian's physiognomy. This matter is closely related to our subject, for the cavities under the cheek bones play an important part in the determination of that voice quality with which we are here concerned. The high cheek bones of the Indian may not be the only inherited element concerned. Other bone shapes may accompany it. But this one form of bone will serve as sufficient basis for my claim. Where Indians and French intermarry, some of their descendants have high cheek bones and some have not. The prevalence of the high cheek bone among pure-blooded Indians is evidence of its transmission, and its occasional occurrence in families of mixed blood is still further evidence in favour of this form of heritability. The inheritance of bone shapes is beautifully illustrated also in the Greek nose, and by the familiar peculiarity of the nose of the Jew. Here are three cases of inheritance of bone shapes, and hence of cavity forms. Why omit mention of our own noses, which may to the Greek and the Jew seem as strange as their own, or stranger?

3. Inheritance of Bone Cavity Forms in the Lower Animals.

The heritability of bone shapes and bone cavity forms is so self-evident that it may seem almost superfluous to offer further proof of it. Take the cat, the canary, and the lion. No one doubts that their skulls are inherited to a dot, and that, too, in a certain definite and prescribed shape. The bone shapes are exactly inherited. If this is true, then the cavities formed by these bone shapes are inherited exactly also. The voices of the canary and the elephant, the cat and the rabbit, the mouse and the sparrow, differ radically from species to species, but the vocal quality is always uniform and constant within the species. This is because the bone shapes and cavity forms are uniform and

constant within the species. As these bone shapes are inherited, the vocal quality must be inherited also.

Cavity forms, then, are inherited, and this is just the point I set out to prove. I have shown that numerous references in the literature upon genetics indicate more or less vaguely that bone shapes are inherited. The case of the Indian's cheek bones furnishes an unquestionable instance. The self-evident illustration from the lower animals gives positive proof that skull shapes are inherited, and that, therefore, the bone cavities of the skull are inherited in a definite form.

Without entering into any elaborate proof, I must content myself with a bare statement of the well-known fact that vocal quality, caused and conditioned by the presence and relationship of overtones in the voice, is directly dependent upon the presence of certain forms of resonance chambers or bone cavities. The vocal quality of any individual is what it is because the bone cavities of his skull have a definite shape. I have shown that this definite shape is inherited. Does it not follow that the kind of voice, its kind and quality, will be therefore to a large degree affected by inheritance? The evidence seems conclusive.

With this my proof and my thesis are complete. I have shown that voice quality depends absolutely upon bone structure, that bone structure is inherited, and that therefore vocal quality is inherited.

I offer the present study as a preliminary note only. I think the subject deserves further research. I already have begun further researches. For example:—

1. A research to trace the ancestry of a group of tenors.

2. To see if sopranos and contraltos run in families.

3. To see if absence of vocal excellence is also inherited, and—

4. To discover what bone forms and facial exteriors would warrant with measurable likelihood of success the undertaking of musical careers.

Summary.—(1) Literature on eugenics and cacogenics shows that bone shapes are probably inherited. (2) The noses of the Indians, and the Greeks, and the Jews, prove this pretty conclusively. (3) The lower animals afford data that put this thesis beyond doubt. Thus it is proved that bone forms are inherited.

Then what is contained in them is also inherited, and therefore the functions that those cavity shapes subserve, such as vocal quality and utterance, are likewise inherited.

In brief, I claim abundant evidence to show the possibility of voice inheritance.

110 Bay State Road,
Boston, Massachusetts, U.S.A.

References.

(1) Walter, Herbert Eugene. "Genetics: An Introduction to the Study of Heredity," p. 4. The Macmillan Co., 1914.
(2) Castle, W. E. "Heredity in Relation to Evolution and Animal Breeding," p. 39. D. Appleton & Co., 1911.
(3) By Twelve Authors. "Eugenics: Twelve University Lectures." Dodd, Mead & Co., New York.
(4) Goddard, H. H. "The Kallikak Family." The Macmillan Co., 1912.
(5) Goddard, H. H. "Feeble-Mindedness, its Cause and Consequences." The Macmillan Co., 1914.

Abstracts.

PHYSIOLOGY.

EXPERIMENTAL RESEARCHES ON SENSORY LOCALISATIONS
(151) **IN THE CEREBRAL CORTEX.** J. G. Dusser de Barenne, *Quart. Journ. Exp. Physiol.*, 1916, ix., p. 355 (49 figs).

This is an important paper, and should be read in the original.

Electrical stimulation of the brain has yielded no results bearing on sensory localisation in the brain, nor could such be expected. We owe our knowledge, as far as physiological experiment is concerned, to the extirpation method, which, however, only gives symptoms of defect or impairment of sensation, and it is often difficult to say if these symptoms are directly or only indirectly the result of the lesion.

The author describes here a fresh method, which he terms the "*local strychnine poisoning*" method. It causes symptoms of excitation which can be determined easily and with certainty, and thus possesses a positive advantage over that of extirpation.

The advantages of the strychnine method may be briefly recapitulated as follows:—

1. It produces symptoms of excitation in the sensory sphere.
2. It can be applied without damaging the brain.
3. The cortical lesion is of a functional nature and strictly localised.
4. The animal shows spontaneously to what parts of the body sensory symptoms are referred.
5. It enables us to establish definite results by relatively brief experiments.

The method consists in trephining the skull, and opening the dura. The cerebro-spinal fluid is absorbed with a little cotton-wool, and a 1 per cent. strychnine sulphate solution, coloured with toluidin blue, is then applied to the cortex. This is best done by touching it with a piece of cotton-wool about 1 sq. mm. The piece of cortex is then dapped with dry cotton-wool, and the poisoned spot is then seen as a small blue area a few mm. in extent. The wound is then closed, and the animal is allowed to recover from the anæsthetic.

On recovery from the anæsthetic the animal (cat) shows extreme discomfort in some part of the body, *e.g.*, if the fore-limb, it keeps it raised off the floor; if touched, it bites, scratches and tears at it, spitting at anything coming near it. If the brachial plexus be completely divided, these symptoms are not affected.

The sensory disturbances produced concern both cutaneous and deep sensitivity. The symptoms of cutaneous sensitivity manifest themselves by (*a*) symptoms of spontaneous excitation, paræsthesiæ; (*b*) hyperæsthesia and hyperalgesia; and (*c*) exaggeration of Munk's "Berührungesreflexe." The disturbances in deep sensitivity manifest themselves in an abnormal hypersensitivity to pinching and pressure of the bones, tendons, and muscles. When the poison is applied to the active zone of *one* hemisphere only, cutaneous hypersensitivity and the resulting symptoms, are always present on *both* sides of the body—stronger on the contralateral side, less strong, but very distinct, on the ipsilateral. The disturbances of deep sensitivity consequent on the application of the poison to the active zone of one hemisphere only are always unilateral, and on the contralateral side of the body.

The so-called "active" zone may be subdivided according to the parts of the body where sensory disturbances show themselves, as follows:—

(*a*) Head zone: this includes the sensory representation of the neck as well as of the head.

(*b*) Fore-limb zone: this includes the sensory representation of the trunk as well as of the fore-limb.

(*c*) Hind-limb zone.

(*d*) Zone of "crossed symptomatology." On applying strychnine anywhere in this zone we find disturbances of cutaneous sensitivity are provoked in the ipsilateral fore-limb and in the contralateral hind-limb.

The fore-limb and the head zones almost entirely overlap one another (contrary to the view of Munk and Rothmann).

In so far as any sensory zone overlaps the motor area (the position of the latter being decided by methods different from those herein dealt with), there may be said to exist in the cat, and probably also in the dog, a *common sensori-motor cortical zone*, as Munk and others have held.

Except in one instance, out of thirty-four experiments, none have furnished any proof of a segmental distribution of the sensory disturbances caused by strychnine application to the cortex. Except in one experiment no genuine symptoms of motor excitation — such as muscle twitchings, hyper-reflexia, and exaggeration of tendon and periosteum reflexes—have been observed. This absence of motor symptoms may have been due to the fact that the application of strychnine was always slight, and the poison was probably confined to the more superficial layers of the cortex. The lobus frontalis has no sensory functions in the cat.

The author concludes with the following statement:—"Without underestimating the significance of cytoarchitectonic studies for our knowledge of the structure and function of the central nervous system, I am of the opinion that the time has not yet arrived for basing so far-reaching a conclusion (differentiation of function) on a difference of cytotectonic structure of the cortical zones, and that, at least at present, the results of physiological experimentation are of greater significance."

A. NINIAN BRUCE.

(152) **A CONTRIBUTION TO THE BIOLOGY OF PERIPHERAL NERVES IN TRANSPLANTATION. — II. LIFE OF PERIPHERAL NERVES OF MAMMALS IN PLASMA.** RAGNVALD INGEBRIGTSEN, *Journ. Exp. Med.*, 1916, xxiii., Feb., p. 251 (13 figs.).

THE Wallerian degeneration occurring in peripheral nerves by incubation in Ringer solution and serum does not occur in plasma. Peripheral nerves incubated in plasma give rise to no growth. The same is true of peripheral nerves in a Wallerian degeneration up to the fourth day.

Peripheral nerves in Wallerian degeneration from the fifth

day give rise to a growth of the syncytium of Schwann. In cultures from later stages there is a progressive growth of the same structure. It is evident that the proliferation of the cells of Schwann is directly produced by the degeneration of the axis cylinder and its myelin sheath.

In no case was growth of axis cylinders observed.

The growth of the syncytium of Schwann from degenerating nerves affords a basis for an anatomical conception of the centrifugal orientation of growing axis cylinders in regeneration.

Morphologically there is a striking resemblance between the syncytium of Schwann and neuroglia growing in plasma.

A. NINIAN BRUCE.

THE CEREBRO-SPINAL FLUID.—IV. CIRCULATION. W. E. DIXON (153) and W. D. HALLIBURTON, *Journ. of Physiol.*, 1916, l., p. 198.

SUBSTANCES introduced into the cerebro-spinal fluid which can be readily traced do not find an exit by the lymph channels, but appear rapidly in the blood. If these substances are readily diffusible, the speed with which they appear in the blood is very remarkable, especially if they are introduced into the sub-cerebellar region. An injection of substances like adrenalin, nicotine, and atropine produces characteristic physiological effects almost as rapidly as if injected into the venous circulation.

Substances which are indiffusible, such as proteins (Witte's peptone, serum in anaphylactic animals), do not produce their characteristic effects when they are introduced into the cerebro-spinal fluid, whereas substances of intermediate molecular size, such as secretin, diffuse slowly, and cause their characteristic actions at an intermediate rate.

The old theory that there are actual valved orifices leading into the large veins at the base of the brain is thus rendered quite untenable. The transference must be by diffusion. This diffusion process is most rapid in the sub-cerebellar region, and is extremely slow in the lower spinal district. It probably occurs into the venous sinuses by the microscopic arachnoid villi described by Weed (*v. Review*, 1914, xii., p. 512), but Mott's view that the transference partly occurs through the thin walls of the blood-vessels within the central nervous system is not excluded by the authors' experiments, seeing that contact of these vessels with the cerebro-spinal fluid is maintained throughout their extent by the perivascular spaces which are continuous with the subarachnoid cavity.

The authors further hold this must also be the course taken by the normal cerebro-spinal fluid, and that it is by the blood

and not by the lymph that the fluid which is constantly being secreted finds its main exit from the cranio-vertebral cavity. Evidence is given to show that dyes added to the fluid travel along the course of certain cranial nerves, especially the olfactory nerve. In the spinal nerves, no dye can be detected in their sheaths outside the spinal. No dye can be seen in the lymph of the thoracic duct.

Diffusion in the opposite direction from blood to cerebro-spinal fluid does not occur, except in an almost negligible degree in the case of a few drugs. The secreting epithelium of the choroid gland thus protects the tissue elements of the central nervous system from being bathed with harmful substances.

Pituitary extract has no direct action on the secretory activity of the choroid gland; the opposite statement by Weed and Cushing (*c. Review*, 1915, xiii., p. 25) is explained by the non-exclusion in their experiments of an asphyxial condition (due to constriction of the bronchioles) which is a powerful stimulus to cerebro-spinal secretion.

A. NINIAN BRUCE.

(154) **OBSERVATIONS ON THE NERVE ENDINGS, RECEPTIVE SUBSTANCE, AND CONTRACTILE SUBSTANCE OF MUSCLE.** D. NOËL PATON and LEONARD FINDLAY, *Journ. of Physiol.*, 1916, l., p. 193.

THE "receptive substance" of muscle generally remains unaltered for some time after the nerve has ceased to act. In some cases it may have its excitability modified during the process of degeneration of the nerve. The development of the slow generalised contraction with the increased response to galvanic stimulation, which is characteristic of the reaction of degeneration, may be a result of the degeneration of the "receptive substance."

A. NINIAN BRUCE.

(155) **EVIDENCE THAT THE ACTIVE PRINCIPLE OF THE RETRO-PERITONEAL CHROMAPHIL TISSUE HAS THE SAME PHYSIOLOGICAL ACTION AS THE ACTIVE PRINCIPLE OF THE SUPRARENAL GLANDS.** M. E. FULK and J. J. R. MACLEOD, *Amer. Journ. Physiol.*, 1911, xl., p. 21.

ACID extracts of the retro-peritoneal chromaphil tissue of man, the dog, cat, rabbit, guinea-pig, white rat, calf, sheep, and pig, have the same physiological action on intestinal and uterine muscle as the active principle of the medulla of the suprarenal glands.

A. NINIAN BRUCE.

PATHOLOGY.

THE CONTROL OF EXPERIMENTAL CRETINISM. H. RAYMOND
(156) BASINGER, *Archives of Int. Med.*, 1916, xvii., p. 260.

TRANSFUSION of normal blood serum into cretins has no effect on the condition of cretinism. Transfusion of "hyperthyroid" (thyroid-fed animals) blood serum into cretins is effective in increasing the growth, and in controlling the other symptoms of cretinism. The improvement, however, is not as marked as with the thyroid feeding.

Standard thyroid preparation (containing 0·2 per cent. iodine in organic combination), when given in carefully controlled non-toxic doses, will increase the growth of cretin rabbits, and prevent the development of, or counteract, the other symptoms of cretinism. But thyroid feeding fails to carry an absolute cretin to full normal stature. Discontinuing the thyroid feeding leads to a return of some of the cretin symptoms.

The thyroid metaprotein of Koch is somewhat more active than standard thyroid preparations, but also more toxic.

Kendall's thyroid extract B has no effect on any of the symptoms of cretinism. It is non-toxic, at least in ordinary doses.

Cretins are more susceptible than the normal animals to the toxic action of thyroid (thyroid feeding).

Cretin rabbits, despite their retarded rate of growth, continue to grow for a considerably longer time (four to six weeks) than the controls of the same litter. A. NINIAN BRUCE.

CLINICAL NEUROLOGY.

OVERACTIVITY AS A POTENT FACTOR IN THE ETIOLOGY OF
(157) **SOME NERVOUS DISEASES. Inquiry of 187 cases.** ALFRED GORDON, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 641.

THIS is an attempt to show the effect of overfunction of organs upon their early morbidity. A body potentially diseased, or under the influence of a disordered metabolism through the presence of a toxic material, will develop morbid phenomena primarily in parts functionally exhausted. The "exhaustion view" can be demonstrated quite satisfactorily in syphilitic affections of the nervous system, in alcoholism, in plumbism, in acute infectious diseases such as anterior poliomyelitis, in profound anæmias, and in other conditions accompanied by profound metabolic disturbances of any nature. It explains the constant and almost

uniform and earliest involvement of these portions of the body that are kept in a state of fatigue.

This observation is very important for treatment. In chronic toxæmias, early treatment, combined with removal from the usual occupation at the earliest possible moment, may prevent localised morbid manifestations such as in locomotion and eye symptoms in tabes, or localised palsies in intoxications. A potential syphilitic individual may avert for a long period of time the early oncoming of morbid manifestations of syphilitic or parasyphilitic character in the domain of the nervous system. A. NINIAN BRUCE.

THE BRADSHAW LECTURE ON NERVOUS AFFECTIONS
(158) **OF THE SIXTH AND SEVENTH DECADES OF LIFE.** J. MITCHELL CLARKE, *Lancet*, 1915, Nov. 6 and 13, pp. 1016 and 1069.

THE paper deals only with diseases of the spinal cord and brain, which are considered individually. It cannot be studied with value in an abstract. R. DODS BROWN.

A CASE OF MYOTONIA CONGENITA (THOMSEN'S DISEASE)
(159) **IN A CHILD.** JOHN THOMSON, *Edin. Med. Journ.*, 1916, xvi., March, p. 216 (7 figs.).

THE patient was a boy, aged 6 years. The complaint was slowness in opening the eyes from early infancy, and stiffness in the lower limbs ever since he had been able to walk. He was an only child, had always been healthy, began to walk at fourteen months, always moved slowly at first, but soon could run about as fast as other children. The voluntary muscles all over the body were much larger and also stronger than those of a normally well-developed child. They showed the same deliberation in contraction as the muscles of the eyelids whenever an attempt was made to bring them suddenly into action for the first time after a period of rest.

A small piece of the left gastrocnemius muscle was excised and examined by Dr James W. Dawson, who reported:—"The outstanding feature is a marked nuclear increase (sarcolemma nuclear proliferation). The muscle fibres are also slightly enlarged, and the longitudinal and transverse striation, as far as can be ascertained, is slightly more evident." A. NINIAN BRUCE.

CASE OF PSEUDO-HYPERTROPHIC MUSCULAR DYSTROPHY
(160) **ASSOCIATED WITH AMENTIA.** E. G. FEARNSIDES, *Proc. Roy. Soc. Med.*, 1915, viii., April (Sect. Study Dis. of Child.), p. 75.

THIS case showed muscular backwardness of severe degree, and pseudo-hypertrophic muscular dystrophy. According to Oppenheim, this association is not infrequent, but it appears to be rare in this country. The pseudo-hypertrophy in this case was not altogether typical, as although the calves, infraspinati, lower portions of latissimus dorsi, and lower portions of the erector spinæ were involved, peculiar masses were present in the lateral aspects of the axillæ and chest wall, which appeared to be due to hypertrophies in the serratus magnus. A. NINIAN BRUCE.

SELECTIVE SENSORY REGENERATION IN AN ULNAR NERVE
(161) **LESION.** ISADOR H. CORIAT, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 407.

A PATIENT completely divided his left ulnar nerve by accidentally cutting it with glass. The nerve was sutured about two months later.

During the process of nerve regeneration, isolated pain points could be demonstrated in a completely anæsthetic area, while inside this area the pain points were so closely crowded together that they formed a zone of extreme hyperalgesia. Deep sensibility was intact (muscle-spindles). The condition proves that the specific receptors for pain (protopathic fibres) were not only independent, but also were more capable of rapid regeneration than the specific receptors for touch (epicritic fibres).

A. NINIAN BRUCE.

NEEDLESS SURGICAL OPERATIONS FROM FAILURE TO
(162) **RECOGNISE TABES DORSALIS.** JOHN W. NUZUM, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 482.

OF 1,000 tabetics, 8·7 per cent. have been subjected to laparotomy under mistaken diagnosis one or more times. The "crises" of tabes have largely influenced the surgeon in his decision to operate. This statement is supported by the fact that 65 per cent. of the eighty-seven patients operated on presented visceral crises. In 17 per cent. of these the "crises" were the *initial symptoms* of their disease. Mistaken diagnoses and resulting operations occur chiefly through failure to examine the nervous system.

Gastric ulcer, gall-bladder disease, and appendicitis are the diagnoses most frequently made.

Tabetics subjected to several successive laparotomies have, as a rule, been operated on by as many different surgeons.

A history of paroxysmal attacks of vomiting, rheumatism, paresthesias, bladder disturbances, or fractures without physical violence should excite interest to exclude tabes dorsalis.

The cytodiagnosis of the cerebro-spinal fluid, together with the Wassermann reaction with the spinal fluid, are of inestimable value in doubtful cases. A. NINIAN BRUCE.

ON THE CLINICAL SYMPTOMS OF NASAL DIPHTHERIA
(163) **AND THE NERVOUS COMPLICATIONS OF DIPHTHERIA.** (**Contributo alla clinica della difterite nasale e sulle complicanze nervose della difterite.**) G. F. RANDEGGER, *Riv. di Clin. Pediatr.*, 1915, xiii., p. 488.

A BOY, aged $3\frac{1}{2}$ years, developed nasal diphtheria which persisted for two months, and was complicated by palatal and ciliary paralysis, squint, paresis of the orbicularis palpebrarum and of the lips, loss of voice, paralysis of the neck and trunk muscles, paresis of the lower limbs, paresis of the anal sphincter, absence of all the deep reflexes, and diminution of sensibility to pain. A few days later there was aggravation of the general condition, with fever, apathy, somnolence, Kernig's sign, and left hemiplegia. Lumbar puncture showed hypertension of the cerebro-spinal fluid, with a large amount of albumin, abundant lymphocytosis, and absence of germs, thus constituting serous meningitis. Complete recovery took place apart from paresis of the left lower facial, which persisted. Randegger attributes the hemiplegia to a diffuse meningo-encephalitis of toxic origin, chiefly affecting the Rolandic area, especially in the lower two-thirds on the right side.

J. D. ROLLESTON.

OPTIC NEURITIS IN THE COURSE OF MENINGITIS CAUSED
(164) **BY PERNICIOUS MALARIAL FEVER.** (**Nevrite optica no decurso de meningite determinada por febre perniciosa palustre.**) A. A. DA MATTA, *Arch. Brasil. de Med.*, 1915, v., p. 320.

A RECORD of a case in a youth, aged 16, ending in recovery after six days' treatment with quinine, 15 grains every twenty-four hours, and calomel in fractional doses. J. D. ROLLESTON.

CEREBRO-SPINAL MENINGITIS IN ADVANCED LIFE.
(165) **(Méningite cérébro-spinale chez des adultes âgés.)** H. ESCHBACH and H. LACAZE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1323.

MENINGITIS in the elderly assumes various forms. In those who are still strong and vigorous the disease runs much the same course as in the young. In the majority, however, the symptoms are much less marked.

Five illustrative cases are recorded in patients aged from 49 to 60; three recovered and two died. J. D. ROLLESTON.

LOCALISED MENINGITIS OF THE BASE. PURIFORM
(166) **ASEPTIC REACTION OF THE CEREBRO-SPINAL FLUID. MENINGOCOCCAL SEPTICÆMIA. RECOVERY. (Méningite localisée à la base. Réaction puriforme aseptique du liquide céphalo-rachidien. Méningococcémie. Guérison.)** BOIDIN and WEISSENBACH, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1224.

THE title indicates the two stages of the disease. In the first stage intraspinal injections of anti-meningococcal serum were given, while the second or septicæmic stage was treated by intravenous and subcutaneous injections of serum, followed by an autogenous vaccine, and lastly by a fixation abscess. J. D. ROLLESTON.

MENINGOCOCCAL AND PNEUMOCOCCAL MENINGITIS IN A
(167) **PATIENT WITH CHRONIC OTORRHŒA. (Méningite cérébro-spinale à méningocoques et à pneumocoques chez un sujet atteint d'otorrhée ancienne.)** P. SAINTON and J. MAILLE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1279.

A FATAL case in a man, aged 46. Clinically the disease showed two stages. 1. A stage of pure cerebro-spinal meningitis, for at the onset the meningococcus only was found in the spinal fluid, and considerable improvement followed the injection of anti-meningococcal serum. 2. A stage of otogenic pneumococcal meningitis, shown by the appearance of left facial paralysis, and right ptosis. Bacteriological examination at a late stage of the disease, and post mortem, showed the coexistence of the pneumococcus and meningococcus in the ear discharge, cerebro-spinal fluid, and blood. J. D. ROLLESTON.

EPIDEMIC CEREBRO-SPINAL MENINGITIS DEVELOPING
(168) **TWENTY-TWO HOURS AFTER ABDOMINAL OPERATION: Report of a case.** LEWIS M. GAINES, *Journ. Amer. Med. Assoc.*, 1916, xvi., Feb. 19, p. 558.

THE meningitis developed suddenly without warning. After the initial convulsion there was an entire absence of the physical signs of meningitis for twenty-four hours. The only symptoms were convulsions, muscular twitchings, and coma. Diagnosis was made as the result of lumbar puncture.

The infection probably arose from purulent material in the nasal passages, and possibly the anæsthetic had allowed the passage of organisms into the meninges. There was no union of the operative wound until after the complete subsidence of the meningitis. Complete recovery resulted from Flexner's serum.

A. NINIAN BRUCE.

MENINGITIS SEROSA. T. GILLMAN MOORHEAD, *Dublin Journ. Med.*
(169) *Sci.*, 1916, Jan. 1, p. 1.

THE author gives the notes of three cases of interest:—

1. Female, æt. 13, previously perfectly healthy, attacked by an acute illness thought to be influenza. Shortly afterwards complained of dimness of sight, severe headache, and sickness.

When seen by Dr. Moorhead she had severe optic neuritis, nystagmus, and loss of knee jerks. Apparently no other signs.

The optic neuritis appeared to increase and then gradually subsided, so that in six weeks both fundi were normal. Three months later child practically normal.

2. A girl, previously in good health, suffered from acute tonsillitis, general febrile disturbance, and pains in the limbs.

This illness only lasted two days, but left her with a headache. A week later she woke with a bad headache, vomited, talked in a confused way, and said her sight was dim. She was also jaundiced. In a few hours she became unconscious, and two days later was seen by Dr. Moorhead. She was deeply jaundiced and absolutely comatose. Pupils dilated, head retracted, and neck stiff, arms and legs flaccid, knee jerks feeble, swallowing difficult.

The cerebro-spinal fluid came away with great pressure and was normal, except that it was said not to reduce. She soon began to improve, and gradually recovered uneventfully.

The author suggests that both of these cases are examples of serous meningitis, infective in origin.

3. This case has been published by the author before in detail. A man of 37, suffering from pains in the bones, and rigors. He

had been ill for three weeks. Physical examination revealed nothing abnormal; there was a leucocytosis of 30,000. On the day of admission the temperature reached 104·4, with a rigor, severe joint pains, and profuse sweatings. This was repeated for seventy-three days. During the last fourteen days there was severe headache, Kernig's sign, and Babinski's reflex. The patient died in coma. The post mortem showed recent pericarditis, and distension of the lateral ventricle with fluid; the subarachnoid fluid was slightly turbid.

The blood and cerebro-spinal fluid contained the *B. coli communis* and a pneumococcal-like organism.

This case the author considers to be one of infection, terminating in ependymitis and meningitis.

The author refers to a paper by Warrington in the *Quart. Journ. of Medicine*, Jan. 1914 (*v. Review*, 1914, xii., p. 114).

The reviewer agrees with Dr. Moorhead in considering that cases of this type are not uncommon, and are to be thought of when unusual cerebral symptoms of intracranial pressure are present.

A more thorough investigation of the genesis and pathological results is required in certain obscure cases characterised by coma.

W. B. WARRINGTON.

DIFFERENTIAL DIAGNOSIS BETWEEN CEREBRAL HÆMOR-
(170) **RHAGE AND SOFTENING DUE TO THROMBOSIS.** G. BURKE and J. NUZUM, *Med. Record*, 1915, lxxxviii., p. 701.

A WOMAN, aged 66, was brought to hospital in a comatose state. No adequate history was obtainable. The high blood-pressure (170), conjugate deviation, temperature of 103·8°, hypertrophy of the left ventricle, and presence of albumin and casts in the urine, led to a diagnosis of cerebral hæmorrhage. The autopsy, however, showed thrombosis of the right middle cerebral artery, with an area of softening involving the region of the basal ganglia in the posterior limb of the internal capsule and the inner and lower part of the occipital lobe. There was also nodular syphilitic arterio-sclerosis, most marked in the descending thoracic aorta.

J. D. ROLLESTON.

A CASE OF ACROMEGALY. F. PARKES WEBER, *Proc. Roy. Soc. Med.*,
(171) 1915, viii., April (Clin. Sect.), p. 55.

THE patient was a Russian Jew, aged 48, and the interest of the case was the association of acromegaly with chronic glaucoma.

A. NINIAN BRUCE.

IMPAIRMENT AND LOSS OF SEXUAL POWER IN ACROMEGALY. (172) W. A. BOYD, *Med. Record*, 1915, lxxxviii., p. 824.

BOYD examined the records of 85 published cases of acromegaly, 50 of which were in men, and 35 in women, and found that 68 per cent. of the former and 89 per cent. of the latter had some sexual impairment. There were numerous examples of imperfectly acquired secondary sexual characteristics when the pituitary lesion antedated puberty, and of amenorrhœa or impotence when the disease developed after adolescence. J. D. ROLLESTON.

THE HYPOPHYSIS AND DIURESIS.—I. DIABETES INSIPIDUS AND ITS RELATION TO THE HYPOPHYSIS. II. STUDIES ON THE ACTION OF PITUITARY EXTRACTS, ESPECIALLY ON DIURESIS, BLOOD-PRESSURE, AND NITROGEN EXCRETION IN RELATIVELY NORMAL PERSONS. (173) **(Hypofyse og diurese.—I. Diabetes insipidus og dens forhold til hypophysis cerebri. II. Studier over hypofyseekstrakters virkinger—særlig paa diurese, blodtryk og N-omsætning, hos relativt friske mennesker.)** K. MOTZFELDT, *Norsk Mag. f. Lægevid.*, 1915, lxxvi., p. 1305.

I. THE writer reviews the literature and records three cases of diabetes insipidus in women, aged from 23 to 42, illustrating insufficiency of the posterior lobe of the hypophysis. The diuresis diminished in each case after administration of pituitrin or pituglandol.

II. The writer studied the diuresis in fifteen patients who had been given extracts of the posterior lobe of the hypophysis, and in every case found marked reduction of the quantity of the urine and increased concentration. The blood-pressure was lowered, as a rule, in a few cases after a transitory initial rise. The nitrogen excretion was not affected. The effect on the diuresis was not checked by the simultaneous administration of adrenalin. Extracts of the anterior lobe had no effect on the diuresis.

J. D. ROLLESTON.

TWO CASES OF PLUMBISM FROM UNUSUAL SOURCES. (174) ARTHUR HALL, *Lancet*, 1915, Oct. 2, p. 750.

THE first patient was a steel melter who did not use lead in any form at his work. He had been in the habit of drinking "horehound beer" for many years. Formerly it had been sold in stone jars, but recently it had been kept in barrels in the cellar, and drawn up into the shop by means of an ordinary beer tap. Thus

the beer had to pass through several feet of lead piping. The fluid was examined, and it was found to contain 1 grain of lead per gallon.

The second case was a man who took a keen interest in his garden, and who was in the habit of shooting birds which came into it. He carried lead pellets in his vest pocket. It was thought that he was constantly fingering them, and that his food was contaminated in this way. R. DODS BROWN.

SANITATION AND THE CONTROL OF PELLAGRA. CHARLES T.
(175) NESBITT, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 647.

THERE is no existing relation between soil pollution and the incidence of pellagra. Close supervision of all cases, disinfection, fumigation, isolation, and the other means of controlling infection have no influence on pellagra incidence. Business depression, lack of employment, a limited market for products, and increased price of food, with consequent increase of indigence, increase the incidence of pellagra very definitely. A. NINIAN BRUCE.

THE REACTIONS AND RESULTS OF TREATMENT IN CEREBRO-
(176) **SPINAL SYPHILIS.** GEORGE DRAPER, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 400.

THE purpose of this paper has been to show the number and severity of undesirable reactions to treatment, and the results in terms of working capacity. The severest reaction to intravenous injections is of the anaphylactic type. The most frequent reaction to the intraspinous injections is pain. The severest is an aseptic meningitis, which may be anaphylactic in origin.

Twenty-six patients out of thirty-eight were economically useless before treatment. After treatment twenty-two were back on full-time work. Rapidity and degree of improvement depend directly on the intensity of treatment. It is important to keep patients at work during the months of treatment.

A. NINIAN BRUCE.

THE INTRASPINAL TREATMENT OF SYPHILIS OF THE
(177) **CENTRAL NERVOUS SYSTEM, ACCORDING TO THE METHOD OF SWIFT AND ELLIS.** R. DEXTER and C. L. CUMMER, *Archives Int. Med.*, 1916, xvii., Jan., p. 82.

TEN cases are recorded. In six there has been a symptomatic improvement so emphatic that the patients' economic efficiency

has been restored. They were able to work and enjoy life to all intents and purposes as normal individuals. The best results are obtained in cerebro-spinal lues, and in tabes of the early or moderately advanced types. In far advanced tabes the results are in most cases dubious, to say the least. The authors' experience with paresis was so limited as not to admit of any generalisation. It seems probable, however, that very little can be done to improve permanently a paresis once it is well established. The Swift-Ellis method is safe when the original technic is followed out to the letter. The claim of the originators that it is a valuable adjunct to the treatment of syphilitic involvement of the central nervous system is sustained as far as tabes dorsalis and cerebro-spinal syphilis are concerned. It is a method which is not essential in all cases, but which, applied carefully and controlled intelligently, will bring about definite amelioration in symptoms and in laboratory signs, where other accepted modes of attack have failed. A. NINIAN BRUCE.

INTRASPINAL ADMINISTRATION OF MERCURIALISED SERUM
(178) **IN THE TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM.** EDWARD LIVINGSTON HUNT, *Journ. Amer. Med. Assoc.*, 1916, xlvi., Feb. 5, p. 404.

THE reaction from mercuric chloride or sublamin in no way differs from the reaction which follows the administration of salvarsan. The sublamin does not seem to give the same reduction in the cell count or clinical improvement as does the mercuric chloride.

No ill results followed these injections. The three deaths could be easily accounted for, as the patients were practically moribund at the time of the treatment, and were given the injections as a last resort.

The patients with tabes and cerebro-spinal syphilis were helped more than any others.

Such improvement as did occur was evident in the feelings of the patient, in the sphincter control, in the pains, in the gait, and in the serology. There was no improvement in the reflexes.

Such intraspinal treatment can be given only at intervals of two weeks, because a cell count does not fall sooner.

The reaction obtained was one in which the cell count was first greatly increased, and then diminished.

The cell count and the globulin yielded much sooner than did the Wassermann. A. NINIAN BRUCE.

THE ETIOLOGY OF SYPHILITIC AORTITIS. DOUGLAS SYMMERS and GUY H. WALLACE, *Journ. Amer. Med. Assoc.*, 1916, lxvi., p. 397.
(179)

THE mesaortitis of Heller and Döhle is essentially a syphilitic lesion, but its production is favoured by certain other factors, among which age, sex, the length and character of antisyphilitic treatment, intercurrent disease, especially infections such as acute rheumatic arthritis, alcoholism, and operations necessitating prolonged physical strain play a not unimportant rôle.

(*a*) Syphilitic aortitis occurs most often in males—in 80 per cent. of our series—a fact which assumes additional importance when taken in connection with occupational influences.

(*b*) Syphilitic aortitis is a lesion of comparative youth, occurring oftenest between the ages of 30 and 50 years, in 71·4 per cent. of our cases.

(*c*) In untreated or neglected syphilis the average interval between infection and death with anatomic confirmation of the existence of syphilitic aortitis is 20·5 years, from which fact it is apparent that, even in the least favourable circumstances, the lesion arises late in the course of syphilis.

(*d*) About 30 per cent. of all patients with syphilitic aortitis develop aneurysm.

(*e*) At least 15 per cent. of all cases of syphilitic aortitis are attended by dilatation of the first portion of the aorta.

(*f*) About 30 per cent. of all cases of syphilitic aortitis eventuate in sclerosis and retraction of the aortic valves.

(*g*) Leaving out of consideration the occurrence of such clinical phenomena as angina pectoris and cerebral disturbances referable to occlusion of one of the larger branches of the aorta, such as the innominate or left carotid artery, it appears to be probable that few cases of syphilitic aortitis pursue a course free from subjectively appreciable or even detectable clinical manifestations.

A. NINIAN BRUCE.

STUDIES ON *TREPONEMA PALLIDUM* AND SYPHILIS—II. SPIROCHÆTICIDAL ANTIBODIES AGAINST *TREPONEMA PALLIDUM*. HANS ZINSSER and J. G. HOPKINS, *Journ. Exp. Med.*, 1916, xxiii., p. 323.
(180)

THE authors describe experiments showing that the serum of rabbits and sheep immunised with cultures of *Treponema pallidum* (not virulent spirochætes) acquires spirochæticidal properties for these culture spirochætes.

The normal serum of these animals also possesses spirochæticidal action if used in sufficient quantities, and the action of the immune

serum represents probably an increase of the antibodies normally present.

Both normal and immune spirochæticidal properties are destroyed by heating to 56° C.

The spirochæticidal action of the immune serum can be reactivated by the addition of fresh normal serum of the same species, insufficient in amount to exert a spirochæticidal effect by itself.

The structure of these spirochæticidal bodies, therefore, is entirely analogous to that of the well-known bactericidal antibodies known to exist in antibacterial sera. A. NINIAN BRUCE.

STUDIES ON *TREPONEMA PALLIDUM* AND SYPHILIS—III.

(181) **THE INDIVIDUAL FLUCTUATIONS IN VIRULENCE AND COMPARATIVE VIRULENCE OF *TREPONEMA PALLIDUM* STRAINS PASSED THROUGH RABBITS.** HANS ZINSSER, J. G. HOPKINS, and MALCOLM M'BURNEY, *Journ. Exp. Med.*, 1916, xxiii., p. 329.

STRAINS were isolated from condylomata, chancres, mucous patch, and one from the nervous system. There was no consistent change, either increase or decrease of rabbit pathogenicity during progressive rabbit passage. There was no consistency of difference in speed of incubation between these various strains. The nature of the lesion produced by any individual strain, and the incubation time as well, are dependent upon the fortuitous factors incident to the nature of the material used, the technique of injection, and the size of rabbit in which the injection is made.

All the rabbits were intratesticularly inoculated.

A. NINIAN BRUCE.

STUDIES ON *TREPONEMA PALLIDUM* AND SYPHILIS—IV.

(182) **THE DIFFERENCE IN BEHAVIOUR IN IMMUNE SERUM BETWEEN CULTIVATED NON-VIRULENT *TREPONEMA PALLIDUM* AND VIRULENT TREPONEMATA FROM LESIONS.** HANS ZINSSER, J. G. HOPKINS, and MALCOLM M'BURNEY, *Journ. Exp. Med.*, 1916, xxiii., p. 341.

ALTHOUGH antibodies can be produced by the immunisation of animals with cultivated *Treponema pallidum*, and although these antibodies exert specific agglutinative and treponemicidal action upon the culture organisms, they possess, at least in the concentration so far obtained by the authors in rabbits and sheep, practically no action for virulent treponemata obtained directly from lesions. There seems to be in the infected body an inability to exert a purely serum action upon the virulent treponemata, a

condition of affairs which may well lead to a lack of antigen absorption on the part of the body, and a consequent failure to produce serum antibodies.

Possibly the authors were working with sera not sufficiently powerful. A. NINIAN BRUCE.

THE CORRELATION OF CLINICAL AND SEROLOGICAL FIND-
(183) **INGS IN PARESIS AND CEREBRO-SPINAL SYPHILIS.** IRA A. DARLING and P. B. NEWCOMB, *Amer. Journ. Insan.*, 1916, lxxii., Jan., p. 449.

THE serological findings are analysed in a small series of cases of general paralysis, and of cerebro-spinal syphilis. Exception is taken to the statement that these diseases can be differentiated serologically. Some of their conclusions are:—

(1) A positive Wassermann reaction in the blood seems to be the rule, but even repeated negative findings do not exclude a diagnosis of paresis.

(2) The blood Wassermann reaction may or may not be positive in cerebro-spinal syphilis.

(3) A positive Wassermann reaction was found in the spinal fluids of all paretics and cerebro-spinal syphilitics.

(4) The globulin reaction was very inconstant in both conditions, and of no aid in the differential diagnosis.

(5) The cell count varied greatly in both conditions, but was as great in one as in the other.

(6) Satisfactory diagnosis can only be made when the clinical and laboratory findings are considered together.

D. K. HENDERSON.

THE PERMANGANATE REDUCTION INDEX OF CEREBRO-
(184) **SPINAL FLUID.** W. O. HOFFMAN and A. B. SCHWARTZ, *Archives of Int. Med.*, 1916, xvii., Feb., p. 293.

THE permanganate reduction index of Mayerhofer is specially of value in cases with clear fluids, such as occur in children with meningeal symptoms, but due to other causes than meningitis. It depends upon the fact that the higher content of organic substances and pathological fluids reduce a larger quantity of permanganate solution than normal fluids. The amount of decinormal permanganate solution which, boiled for ten minutes in a strongly

acid medium, is reduced by 1 c.c. of cerebro-spinal fluid, is called by Mayerhofer the "*permanganate reduction index*."

This index was here determined on the spinal fluids obtained from patients admitted to the hospital for a number of different conditions. Indices classify themselves into three groups:—

1. Low indices, below 2.
2. Border-line indices, between 2 and 2·5.
3. High indices, above 2·5.

All normal fluids, or fluids from patients presenting convulsions or other meningeal symptoms, without actual inflammation of the brain or meninges, give low indices. A few such conditions are given. A similar index may be obtained in brain tumour.

Border-line indices may occur in the early stage of an inflammatory process, involving the brain or meninges, in serous meningitis, encephalitis, or other conditions associated with hyperæmia of the brain. High indices, if constant, almost invariably indicate an actual inflammatory process of the brain or meninges. The two diseases most likely occurring with such indices are tuberculous meningitis and acute poliomyelitis.

The Mayerhofer test possesses a distinct value in the examination of the cerebro-spinal fluid. A. NINIAN BRUCE.

DRY PERMANENT STANDARDS IN THE WASSERMANN REACTION, AND A TECHNIC BASED ON THEIR USE.

(185) STERNE MORSE, *Psychiatric Bulletin*, 1916, ix., Jan., p. 47.

IN the measurement of the various reagents used in the Wassermann reaction, efforts have been made to secure stable standards of the various substances in use. These have been obtained by drying in a high vacuum at a low temperature, and with these preparations other standards for working use have been compared under standard conditions, the units in the last analysis being purely arbitrary, as is the case with all legal standards. In this way stable standard amboceptor, stable standard normal serum, and stable positive serum have been prepared and compared. A stable complement, or one with a known and measurable deterioration, has also been prepared. A definite amount of these has been taken as a "unit." Standard conditions stating the allowable error in each measurement have been provisionally formulated. The point of 50 per cent. hæmolysis has been taken as the standard titration point, read colorimetrically in daylight. An efficient and practical method of sending specimens refrigerated for a long distance is described. A. NINIAN BRUCE.

CLINICAL STUDIES IN EPILEPSY. L. PIERCE CLARK, *Psychiatric* (186) *Bulletin*, 1916, ix., Jan., p. 60.

THE study of essential epilepsy by the case-method is here undertaken to show that this disorder is a logical sequence of a certain type of individual make-up in the process of its natural development, and that the varied epileptic reactions occurring in such individuals have more or less of a definite relationship to the existent defect of instincts, plus the precipitating causes which act as psychic irritants.

The first section restates the hypothesis of the nature and pathogenesis of essential epilepsy, with a review of the literature bearing upon this particular hypothesis; then follows some case notes in abstract to illustrate the make-up and the genesis of the first epileptic reaction.

The second section is based upon a study of a single case to show the ordinary pathogenesis of essential epilepsy. The third section is another study of the make-up, the environmental stresses, and the sequential epileptic reactions that occur in a classic, mildly deteriorated individual. The fourth section is a study of two septs of familial epilepsy, with detailed notes of the pathogenesis of fits in one member. The fifth section embraces some therapeutic suggestions derived from the newer psychological views of essential epilepsy. The sixth and last section is devoted to an analysis of several arrested cases of epilepsy, and the probable mechanism by which the discontinuance of the disease was brought about.

A. NINIAN BRUCE.

SENSORY PHENOMENA IN EPILEPSY. E. MURRAY AUER, *Amer.* (187) *Journ. Insan.*, 1916, lxxii., Jan., p. 439.

A NUMBER of cases of epilepsy are reported, special emphasis being laid on the sensory manifestations, which are described as occurring either as pre-paroxysmal, paroxysmal, or post-paroxysmal phenomena. No particular deductions or conclusions are arrived at.

D. K. HENDERSON.

AFTER-CARE REPORT OF EPILEPTICS FOLLOWING COLONY (188) **TREATMENT.** A. HUME GRIFFITH, *Journ. Ment. Sci.*, 1916, Jan., p. 151.

THE difficulty of forming an opinion as to colony treatment has hitherto been the inability to keep trace of the patients after their discharge. Eighty cases were followed up, and numerous tables are given illustrating the after progress of the patients. Dr Aldren Turner's dictum, "that the disease may be said to be

arrested when there has been no fit for nine consecutive years, and that in 10 *per cent.* of the cases thus arrested a cure may be more or less confidently expected," is probably sound.

H. DE M. ALEXANDER.

A CASE OF SYMMETRICAL GANGRENE OR RAYNAUD'S
(189) **DISEASE ASSOCIATED WITH EPILEPSY.** DAVID F. WEEKS and DAN S. RENNER, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 651.

AN Italian, aged 23 years, who suffered from *grand mal* epilepsy, developed pain in his left foot and ankle following a series of convulsions. Bluish discoloration followed, with similar involvement of the right leg. This spread up both legs to the junction of the upper and middle thirds, and death took place from toxic symptoms twenty-three days from the beginning. There were five *grand mal* convulsions during this illness.

A. NINIAN BRUCE.

THE SALIVARY FACTOR AND ITS RELATION TO DENTAL
(190) **CARIES AND IMMUNITY IN DEMENTIA PRÆCOX AND EPILEPSY.** J. A. MARSHALL, *Amer. Journ. Physiol.*, 1916, xl., p. 1.

THE neutralising power of the saliva secreted by individuals suffering from dementia præcox bears a definite relationship to oral conditions. The relationship is the same as that observed in the normal individual.

The neutralising power of the saliva secreted by individuals suffering from epilepsy shows the same relationship in all conditions.

During the time of muscular activity, incident to an epileptic seizure, the acidity of the saliva is markedly increased. The alkalinity of saliva produced during this period of stress is correspondingly lowered, thus holding constant its total neutralising power. The normality of the saliva is regained within thirty minutes after symptoms of the seizure have subsided.

A. NINIAN BRUCE.

THE ETHICS AND LAW OF DRUG AND ALCOHOL ADDICTION.
(191) Sir WM. J. COLLINS, *Lancet*, 1915, Oct. 16, p. 847; *Brit. Journ. Inebriety*, 1916, xiii., Jan., p. 131.

ALCOHOL and drug addiction must be regarded as examples of the surrender of self-control in favour of self-indulgence. After referring to the writings of John Stuart Mill and Humboldt, the

author states that he considers that compulsory detention as a remedy for inebriety gives only partial relief. This method of treatment is like "drawing water in a sieve." It is stated that sobriety will be effected when all drugs of addiction are only used for medical and legitimate purposes. Reference is made to the benefits derived by the drastic restrictions in the use of strong drink in Russia and France. R. DODS BROWN.

NEURASTHENIA GASTRICA. J. CAMPBELL M'CLURE, *Lancet*, (192) 1915, Sept. 25, p. 695.

A MOST interesting and instructive paper dealing with cases of neurasthenia with stomach symptoms. The article is based on the continuous observation of 100 cases. The gastric contents of 20 patients were examined. In 16 of these the total acidity was increased; in 2 the total acidity and hydrochloric acid content were normal, while in the 2 remaining cases the total acidity was less than normal, and the hydrochloric acid was practically absent. In the 16 cases in which the total acidity was increased, the proportion of hydrochloric acid varied enormously. Gastric dilatation is very frequently present, and this is often associated with chronic appendicitis or spasmodic contraction of the pylorus, secondary to an erosion of the cervix uteri, some cystic or inflammatory condition of the ovary, or a phymosis.

It is suggested that long-continued mental strain, insufficient or coarse food, and physical exhaustion are frequently productive of neurasthenia with definite gastric symptoms. Gastric neurasthenia may be divided into two classes—(1) those in whom the gastric atony is primary, and (2) those in whom the dilatation is part of a general neurosis.

Treatment of the stomach condition by Mitchell's method is recommended. This consists in stroking lightly the skin of the patient, who should be lying on his back, "just inside the cartilages from the tenth to the seventh ribs on the left side." The strokes should be intermittent, and should be carried out twenty or thirty times a minute, at the end of which time it will be found that the stomach is considerably reduced in size. This method of treatment should be continued daily for several weeks.

R. DODS BROWN.

A CASE OF SO-CALLED "TETANISM." J. S. FOWLER, *Edin. Med.* (193) *Journ.*, 1916, xvi., Jan., p. 51.

A BABY, aged 3 weeks, obviously syphilitic, with a large umbilical hernia and ulcerated umbilical wound, presented the characteristic

symptoms of exaggerated hypertonus, myotonia, or "tetanism" ("myotonia of infancy," Hochsinger). The hypertonicity (spasm) was intermittent, but never altogether disappeared, and movements caused a marked temporary increase of spasm.

A. NINIAN BRUCE.

NEURITIS OF COCHLEAR DIVISION OF THE EIGHTH NERVE
(194) **FOLLOWING EXPOSURE TO COLD.** J. S. FRASER, *Edin. Med. Journ.*, 1916, xvi., Jan., p. 41.

"COLD" may affect the ear in two ways:—

1. When due to infection from breathing foul air, &c., it may give rise to acute naso-pharyngitis and, *via* the Eustachian tube, to acute otitis media. This may be only a Eustachian catarrh for a day or two, or may give rise to catarrhal or purulent otitis media accompanied with pain, tinnitus, and deafness. This may resolve spontaneously or be followed by otorrhœa for some time.

2. "Cold" in the form of cold wind or draught blowing on one ear appears rather to give rise to a lesion of the auditory or facial nerve, or both (*v. Review*, 1910, viii., p. 354).

A case of this latter type is recorded occurring in a woman, aged 30, and due to exposure to cold wind. It was not associated with either giddiness or facial paralysis, and there was no Rombergism and no spontaneous nystagmus. A. NINIAN BRUCE.

PSYCHIATRY.

EXPERIMENTAL SYPHILIS IN THE RABBIT PRODUCED BY
(195) **THE BRAIN SUBSTANCE OF THE LIVING PARETIC.** UDO J. WILE, *Journ. Exp. Med.*, 1916, xxiii., Feb., p. 199.

FORSTER and Tomasczewski reported a method in 1913 for demonstrating *Spirochæta pallida* in the living brains of patients suffering from general paralysis.

Many observers, including Noguchi, have succeeded in infecting rabbits with syphilis by inoculating them with material obtained at autopsy from paretic brains, but the results have not been uniformly successful.

Wile obtained brain substance from cases of general paralysis during life by trephining, and found that spirochætes from the living paretic brain could easily infect rabbits with experimental syphilis. They constitute a virulent strain, with a shorter period of incubation for the rabbit than exists with other strains.

A. NINIAN BRUCE.

CULTURAL EXPERIMENTS WITH THE *SPIROCHÆTA PALLIDA* DERIVED FROM THE PARETIC BRAIN. (196) Udo J. Wile and Paul Henry de Kruif, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 646.

Experimental syphilis has been transmitted to rabbits from the living paretic brain (*v. Review*, 1916, xiv., p. 129). The authors now record the transmission of this to the fifth generation of rabbits. They could obtain no evidence of a special neurotropic strain with certain morphological characteristics different from other spirochæte strains. A. Ninian Bruce.

THE TREATMENT OF PARESIS AND TABES DORSALIS BY SALVARSANISED SERUM. (197) Henry A. Cotton, *Amer. Journ. Insan.*, 1916, lxxii., Jan., p. 485.

In this article Cotton concludes the report of his cases of general paralysis by discussing a few "improved" cases, those that were unimproved, and those that died.

Four cases of tabes have been treated, three of whom have shown a very marked improvement. The most gratifying result was obtained in a man, 61 years old, who had had tabes for twelve years, and for two years previous to treatment had been bed-ridden, and had lost all urinary control. Now, after two years have elapsed since treatment was begun, he has no more bladder trouble, can walk with a cane fairly well, and in general is comfortable.

These tabetic cases were treated with both the Swift-Ellis and Ogilvie methods.

In one acute case of luetic meningitis occurring in a boy, 19 years old; who had had syphilis six months previously, a very rapid recovery followed two Swift-Ellis treatments. In two other cases of luetic meningitis of a chronic type treatment has not been so successful.

Cotton apparently limits the term, cerebral syphilis, to syphilitic vascular disease, and reports three such cases, one of whom died, and the other two did not respond to treatment. Although in an abstract it is not customary to criticise, it may be remarked that to talk about luetic meningitis as a separate entity, and then to apply the general or group name, cerebral syphilis, to the vascular types only, is rather confusing. In reference to these cases it is said:—"From our experience in these cases, we are inclined to believe that salvarsanised serum has little effect on cerebral syphilis, although it is possible that in the earlier stages of the disease it might be more effective."

In regard to the various methods of treatment, the author believes that the method of Swift and Ellis is as efficacious as any. "If the Swift-Ellis treatment fails to arrest the process, we have not been able to produce better results in these cases by the other methods."

The only criticism of this method is that it has to be administered too slowly, so that the author has been combining the Swift-Ellis and Ogilvie methods on alternate weeks with good results. It is possible that several cerebral or ventricular punctures would be advisable in each case.

Neosalvarsan is preferred to salvarsan.

As this work of Cotton's on the treatment of general paralysis and allied conditions by salvarsanised serum is one of the most detailed and extensive yet published, his conclusions may be given in full.

(1) In the use of salvarsanised serum we have an agent which does cause definite arrest in paresis, which arrest includes improvement in the clinical symptoms, physical signs, and a corresponding change in the biological reactions from positive to negative.

(2) To be effective the case must be treated in the early stages, as advanced stages show no favourable reaction to the treatment.

(3) The length of time is not always an indication of the severity of the symptoms, but the majority of cases cannot be helped after two or three years have elapsed.

(4) The treatment must be persistent and uninterrupted, grading the amount of dose and frequency of treatment to the condition of the patient.

(5) Tabo-paresis should be cautiously treated, usually with small doses, and not oftener than every three weeks.

(6) The remissions caused by treatment cannot be compared to spontaneous remissions, as in the former the percentage is 35·5, and in the latter 4.

(7) The change in the cell count, globulin content, blood and spinal fluid Wassermann reactions are the direct result of treatment, and not to be compared with the variation found in untreated cases of paresis.

(8) The efficacy of treatment depends not on the type of method used, but on the stage of the disease.

(9) Hence the necessity for early diagnosis in paresis, and prompt treatment.

D. K. HENDERSON.

A CHARACTERISTIC ATTITUDE ASSUMED BY MANY CASES
(198) **OF DEMENTIA PRÆCOX.** R. H. STEEN, *Journ. Ment. Sci.*, Jan. 1916 p. 179.

CASES of dementia præcox, when sitting, frequently adopt the following attitude:—The arms are held close to the trunk, with, as a rule, the elbow-joint in a condition of stiff extension, the hands pronated and resting on the lower part of the thighs, or even on the knees. The body may be upright or bent slightly forward. The legs may be opposed or kept apart. This attitude is possibly an example of reversion, and is seen in the statues of ancient Egypt. The author therefore calls it the "Ancient Egyptian Attitude." Photographs are appended.

H. DE M. ALEXANDER.

FOCAL LESIONS OF THE CORTEX OF THE LEFT ANGULAR
(199) **GYRUS IN TWO CASES OF LATE CATATONIA.** E. E. SOUTHARD and M. M. CANAVAN, *Amer. Journ. Insan.*, 1916, lxxii., p. 553.

IN previous papers Southard has stated that 86 per cent. of his series of dementia præcox cases showed lesions, and that four groups of his cases could be separated out on the basis of focal atrophies and sclerosis in particular areas. The cases with post-central and superior parietal lesions showed catatonia, while in the pre-Rolandic or frontal cases the paranoia features predominated.

The lesion in each of the present cases was superficial, limited to the grey matter, and apparently was not accompanied by any structural disorder of the projection system.

Case I.—An Irish woman, 43 years, who had always been strong, healthy, and efficient, one day, six weeks before admission to the hospital, suddenly fainted. Following this, she complained of her head, worried over trifles, and gradually developed an agitated depression, with suspicions and ideas of persecution. During her seven years' hospital residence she was at times very agitated, restless, and delusional, and then at other periods she was exceedingly resistive, destructive, mute, had frenzies of excitement, and had to be tube-fed. The autopsy showed her death to be due to pulmonary tuberculosis. There were also an internal hæmorrhage, pachymeningitis with partial organisation, variations in the consistence of the encephalon, slight atrophy of encephalon, and especially *a cyst of softening of grey matter of the left angular gyrus with overlying sclerosis of pial vessels, notably veins.* This cyst is supposed to have been due to an old necrosis of tissue supplied by a terminal branch of the parieto-temporal branch of the Sylvian artery.

Case II.—A man, 41 years, who for over three years had been in a hospital for mental disorder, had during his hospital residence various attacks of unexplained temperature disturbance, and finally died after a long-drawn-out physical illness, with multiple discharging tuberculous abscesses. He had come of a poor stock, had at the age of 36 years become inefficient in business, and in his psychosis showed incoherent talk, imperative impulses, mutism, refusal of food, and stupor, during which he had to be catheterised. At other times there was the assumption of fixed attitudes and mannerisms, delusions of persecution, and hallucinations of sight and hearing. The autopsy showed extensive visceral tuberculosis, and the brain was softened except for the occipital tips, and one small focus 1 cm. in the most anterior portion of the left angular gyrus. The microscopic examination revealed tubercle bacilli in this small focus, and also giant cells. In the same area the nerve cells of all layers appeared abnormal, suggesting pigmentation, and a kind of spongy transformation in which the nuclei were not infrequently absent; the neuroglia cells remained in comparative abundance.

This communication may then be summarised as the presentation of two cases of chronic lesion—one a cyst, the other a solitary tubercle of the left angular gyrus, which received the clinical diagnosis of dementia præcox. "The writers are especially interested in the fact that the isolated lesions in these cases are in the parietal region, a region which has been stated in previous work to be correlated with catatonic symptoms."

Plates are presented. D. K. HENDERSON.

THE BIOLOGICAL SIGNIFICANCE OF DELUSIONS. HENRY (200) DEVINE, *Journ. Ment. Sci.*, 1916, Jan., p. 135.

DELUSIONAL formations fulfil a definite function; they are the expression of certain underlying trends in the individual, and they satisfy certain needs. The author gives extracts from the analysis (by "word-association" tests, and method of "free association") of a case of dementia præcox to illustrate that the individual suffering from this affection does not of necessity succumb to circumstances of any particular difficulty, but, owing to internal conflicts, he is unable to adjust himself to ordinary situations. The fault lies in his make-up. The delusions, therefore, are subjectively determined, and relate to intimate personal matters which are not apparent on the surface. The delusions in dementia præcox are the expression of actual impulses or desires which obtrude themselves indirectly into consciousness; the indirect expression being due to the repressive force exercised by the normal personality, or such of it as exists unimpaired. H. DE M. ALEXANDER.

THE CHOLESTEROL CONTENT OF THE SERUM IN MENTAL DISEASES. J. CRUICKSHANK and C. T. TISDALL, *Journ. Ment. Sci.*, 1916, Jan., p. 168.
(201)

THE authors used the colorimetric method and describe it. The sera of 120 cases were examined. Cases with pronounced renal or arterial changes (in which the serum cholesterol content is high) were excluded. Cases of general paralysis had a very low cholesterol content, whereas the content in cases of dementia præcox was considerably higher than normal. Epileptics gave practically normal readings. With the exception of early cases of dementia præcox there is, on the whole, a distinct tendency in cases of prolonged mental disease for the cholesterol content of the serum to fall.

The authors suggest that the high content of cholesterol in cases of dementia præcox may be an expression of abnormal activity of the sexual glands, and the low cholesterol content in advanced general paralytics an index of the loss of functional activity of these glands, seeing it is known that the cholesterol content of the suprarenals increases or decreases with the cholesterol of the blood, and that hypertrophy of the suprarenals has been observed in cases of dementia præcox.

H. DE M. ALEXANDER.

STUDIES ON ALCOHOLIC HALLUCINOSES. CARL VON H. SCHNEIDER, *Psychiatric Bulletin*, 1916, ix., Jan., p. 3.
(202)

ALCOHOL as an hereditary and etiological factor in the production of insanity has been overrated, incidence being confused with cause. Alcoholic hallucinoses are separate and distinct from the toxic Korsakow and delirium tremens, and show no mental or physical sign of a toxic psychoses. The patients who develop hallucinoses are opposed to the homosexual in physical traits, mental characteristics, civil condition, occupation, and general reaction to sexual subjects.

The alcoholic hallucinoses cannot be classed with dementia præcox, because the make-up, the age of onset, the etiology, the suddenness of the onset, the short duration, the complete recovery with unusually good insight and interest and confidence in the future, and the fact that persons developing dementia præcox are not addicted to alcohol, are directly opposed to this classification.

The alcoholic hallucinoses are purely functional, and allied to manic-depressive insanity and to recoverable non-alcoholic episodes, hallucinatory and otherwise, in the constitutionally inferior. The manic-depressive individual is notably given to alcoholic excesses, and manic-depressive attacks and hallucinoses are produced in

the same person, and in different persons, by exactly the same factors, including alcohol.

Alcoholic hallucinosis is a misleading title for the psychosis, because definite precipitating factors other than alcohol are present and necessary in its production, and are often reproduced in the psychosis. Alcohol is not the only factor, or the most important factor, or even a necessary factor in its production, as shown by numerous hallucinoses identical in course and outcome, where alcohol and other toxic factors can be excluded; and other psychoses in the same individuals, in which alcohol plays the same part, are not called alcoholic. A. NINIAN BRUCE.

DEMENTIA AND MULTIPLE BRAIN ABSCESSES. G. B. HASSIN, (203) *Med. Record*, 1915, lxxxviii., p. 737.

THE patient was a man, aged 60, admitted to hospital with a tentative diagnosis of senile dementia. A week later he developed conjugate deviation and continuous contraction of the left leg, arm, and face, which persisted till he became stuporous. The autopsy showed that the symptoms were not due to pachymeningitis, but to multiple brain abscesses coupled with encephalitis. The pus was sterile. The source of the abscesses was the lungs, which showed chronic ulceration and miliary tuberculosis. J. D. ROLLESTON.

THE RELATION OF PELVIC DISEASES TO MENTAL DIS-
(204) **ORDERS.** ANNE E. PERKINS, *Psychiatric Bulletin*, 1916, ix., Jan., p. 26.

PELVIC disease, if causally connected with psychoses, can be regarded only as a factor entering into the causal constellation. There is evidence to show that in manic-depressive insanity, pelvic disease is found more often than in dementia præcox. Gynecological treatment or operation for the relief of pelvic diseases in the author's cases have given satisfactory results in benefiting the mental condition in about half of the cases of the manic-depressive group. No benefit to the mental condition has been observed after operations in cases of dementia præcox. In epilepsy, in a very limited material of three cases, the author saw one very striking and immediate improvement in the mental state, as well as in the frequency of convulsions. In another case the result was less immediate, but also quite satisfactory.

Gynæcological operations may be one of the precipitating causes of psychoses. The severity of the operation bears no constant

relation to the psychosis, and it is possible that the operation may sometimes act merely as a mental precipitating cause.

As to the question of operation in nervous women, not only the physical but also the mental condition should be more thoroughly considered than is often done, and if possible an adjustment should be brought about before the operation is performed. Sometimes the desire to be operated upon is a symptom of a mental condition.

Among 24 cases of insane imbeciles studied, 15 were known to be infected with syphilis or gonorrhœa, or both; 19 had been sexually irregular; 9 had had illegitimate children (one 3; one 5); two, who had married, had each 5 children. A. NINIAN BRUCE.

ANTITYPHOID INOCULATION IN MENTAL DISEASE. (**La vaccinazione antitifica negli ammalati di mente.**) GIUSEPPE VIDONI, *Rassegna di Studi Psichiatr.*, 1915, v., Nov.-Dec., p. 389.
(205)

THE author inoculated a number of different types of mental disease with antityphoid vaccines, and found that there was both a local and a general reaction as well as a formation of antibodies. The reaction seemed to be more severe in the cases whose general condition was worst. No improvement in any nervous or mental case was ever noticed; some even got worse. Epileptic attacks were influenced unfavourably, a point which the author considers agrees with the view that typhoid is one of a group of illnesses which tend to increase epileptic attacks.

A. NINIAN BRUCE.

FOREIGN BODIES SWALLOWED BY AN INSANE WOMAN. DONALD C. BALFOUR, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 421.
(206)

A WOMAN, aged 29, was seen by a nurse to swallow a teaspoon. The X-rays showed apparently three or possibly four spoons in the stomach. A gastrotomy resulted in the discovery of seven lying together and a hairpin. After removal of the spoons and debris, the stomach was examined for injury, but apart from ptosis and a hypertrophied and congested mucous membrane, no evidence of injury was found. A. NINIAN BRUCE.

CRIMINAL RESPONSIBILITY. PHILIP COOMBS KNAPP, *Journ. Crim. Law and Criminology*, 1915, vi., Nov.
(207)

THE author deprecates the fact that all our discussions on criminal responsibility seem to centre round the decisions of the judges in the M'Naughten case, &c., and not on the criminal's

control of his actions. Instead of trying to fit the facts to the various judicial decisions we should rather try to estimate the responsibility of the criminal. An attempt is made to show how the insane, the idiot, the imbecile, the moron, and the dullard are really not up to the normal level, that they are weak in self-control, and form a very large proportion of the alcoholics, drug "fiends," paupers, tramps, prostitutes, ne'er-do-wells and criminals of all but the higher class.

The proposition is put forward that every delinquent should be subjected to a mental examination by a single competent expert or by a commission of experts before his trial. By such a method it is admitted that probably many murderers would escape the extreme sentence, but there is no doubt that lesser delinquents would be put under much more protracted restraint than at present. If the delinquent were found to be mentally defective he could be placed under suitable surveillance for the rest of his life, and not be set at liberty in a year or two to return to his criminal life. D. K. HENDERSON.

A SURVEY OF DEFECTIVE DELINQUENTS UNDER THE CARE
(208) **OF THE MASSACHUSETTS STATE BOARD OF INSANITY.**
A. WARREN STEARNS, *Amer. Journ. Insan.*, 1916, lxxii., Jan., p. 427.

THE term, "defective delinquent," is used to designate a group of constitutionally inferior individuals with criminal tendencies. Owing to the fact that a number of such cases were gaining admittance to schools for the feeble-minded and hospitals for the insane, the Massachusetts Board of Insanity were led to make a survey of all such patients in the hospitals under their control, and secondly, to see what measures could be undertaken to assist in the solution of this problem. In the thirteen State hospitals, and in two institutions for feeble-minded, there were found to be 158 defective delinquents, 106 of whom were females, and 52 were males. This difference is explained by the large number of males in prisons. Of these 158 cases, 43, or 27·2 per cent., had previously been in some penal institution; 79, or 50 per cent., had been in some hospital for the insane or feeble-minded; 23, or 14·5 per cent., had been in charge of some private charitable organisation; and 12, or 7·6 per cent., had been wards of the State Board of Charity. The offences of which these individuals had been guilty comprised sex offences, stealing, illegitimacy, murder, setting fire, drug and alcohol habituation, uncontrollable temper, &c.

It is shown how prison methods are unsuccessful with this class of cases, how in asylums it is difficult to get them to do

work which is useful, and how in schools for the feeble-minded they are a disturbing factor.

The author believes that these "defective delinquents" should be segregated, and that the prisons should be adapted to provide for them. D. K. HENDERSON.

THE FUNCTIONS OF A PSYCHOLOGIST IN A HOSPITAL FOR THE INSANE. SHEPHERD IVORY FRANZ, *Amer. Journ. Insan.*, 1916, lxxii., Jan., p. 457.
(209)

THE psychologist's functions are summed up in the one word, investigation. The psychologist is not concerned with diagnosis or treatment, but with the origin of mental events or processes, with comparing the behaviour of different individuals when subjected to the same forms and intensities of stimuli, with contrasting the abnormal with the normal, and with trying to explain the relationship of specific mental conditions. Furthermore, it is the psychologist's province to devise new methods for the investigation of abnormal conditions, and to create a scientific attitude toward mental diseases in those who are entrusted with the care of mental cases. D. K. HENDERSON.

TREATMENT.

DANGERS OF THE CONTINUOUS BATH. WILLIAM A. WHITE, *Amer. Journ. Insan.*, 1916, lxxii., Jan., p. 481.
(210)

RECENTLY the author has heard of a patient being scalded to death in the continuous bath, probably owing to the fact that the patient had been fastened in the tub. The fallibility of all automatic heat-regulating devices is dwelt upon, and it is insisted that *under no circumstances is a patient to be fastened in the continuous bath.* The nurse should never be allowed to leave the bathroom, and should gain her knowledge of the temperature of the water from a bath thermometer, and from frequently plunging her hand and arm into the bath. D. K. HENDERSON.

Reviews

THE ENDOCRINE ORGANS: An introduction to the study of internal secretion. Sir EDWARD A. SCHÄFER, LL.D., D.Sc., M.D., F.R.S. Pp. ix+156, with 104 figs. 1916. Longmans, Green & Co., London. Pr. 10s. 6d. net.

(211)

PROBABLY in no department of medicine has greater progress been made during recent years than in that of the internal secretions. Many of the contributions to this subject are of somewhat doubtful value, and will require much work still before they can be accepted. The moment is thus ripe for the appearance of some authoritative work upon the subject, telling us clearly what we may accept as established, and what requires still further investigation. This situation is exactly met by the publication of this book, and it is no exaggeration to state that the mere association of Professor Schäfer's name with a book upon this subject is the highest recommendation it could possess.

It is designed to supply a concise amount of our present knowledge for the benefit of students and practitioners who may be desirous of obtaining more information regarding the internal secretions than is afforded by the ordinary text-books of physiology, but have not the time or opportunity to peruse extensive monographs or consult original articles. It is founded upon a course of lectures (Lane Medical Lectures) delivered at Stanford University, California, in the summer of 1913, by Sir Edward Schäfer, and the tracings and photographs, 104 in all, used to illustrate the lectures, are included.

By the expression, *endocrine organ*, is implied an organ which is known to form some specific chemical substance within its cells, and to pass this directly or indirectly into the blood stream. The substance thus formed is the active principle of the secretion. In the case of the external secretions the active agents when present are always of the nature of a ferment, and belong to the class of bodies known as *enzymes*. The active materials of the endocrine organs, on the other hand, are for the most part not rendered inactive even by prolonged boiling, and are certainly of a much simpler chemical constitution than enzymes, and operate by immediate chemical action.

As with drugs, some of these principles yielded by the endocrine organs act by stimulating or exciting cell functions, and others by depressing or inhibiting those functions. Professor Schäfer thus proposes to distinguish the action of the former from that of the latter by using the term *hormone* for those which excite to

increased activity, as distinct from the term *chalone* for those which inhibit or diminish activity. As, however, the word hormone is used with different meanings by different authors, it is here proposed that the term hormone should be employed in the sense in which it was used by its inventor, *i.e.*, to denote any substance in the blood which excites cells of the body to activity, and to express by the term *autacoid substances*, or simply *autacoids*, those specific organic substances which are formed by the cells of one organ and passed from them into the circulating fluid to produce effects upon other organs similar to those produced by drugs. If such effects are excitatory, the endocrine substances producing them are *excitatory autacoids*, or *hormones*, while if they are inhibitory, they are due to *inhibitory autacoids*, or *chalones*, so that we have *hormonic* or *chalonic* autacoids.

The endocrine glands are then grouped into three main heads —the thyro-parathyroid apparatus, the suprarenals, and the pituitary—each of which is composed of two distinct but usually closely intergrown parts. Each gland is then considered in detail from all points of view. There then follow chapters on the internal secretions of the pineal gland, the alimentary mucous membrane, and the pancreas, and the generative organs in the male and female. There is a good index. The illustrations are beautifully reproduced.

No one wishing to understand clearly the present position of our knowledge of the endocrine glands could find a more suitable monograph to study. It is not overloaded with details, is admirably clear and concise, and fulfils so clearly the object for which it was written that its value must be immediately recognised.

THE CRIMINAL IMBECILE. An analysis of three remarkable murder cases. HENRY HERBERT GODDARD. Pp. ix + 157, with 3 illustrations. The Macmillan Company, New York. 1915. Pr. 6s. 6d. net.

(212)

DR GODDARD has already earned for himself a high place amongst those who have devoted themselves to the study of feeble-mindedness, his two previous books upon "The Kallikak Family," and upon "Feeble-Mindedness, its Causes and Consequences" (*v. Review*, 1915, xiii., p. 306), being what is so much required at the present time, namely, a careful study of definite cases approached without previous bias and studied carefully in detail.

He here presents us with a careful study of three murderers, known as Jean Gianini, Roland Pennington, and Fred Tronson. He shows that these three cases were undoubtedly cases of mental

defect. They were all unique, also, in being the first court cases in which the Binet-Simon tests were admitted in evidence, the mental status of these three persons being largely determined by this method. They represent three different phases of the working of the defective mind. Jean Gianini, who murdered his school-teacher, showed the criminal imbecile of high grade and of loquacious type, working by himself. The second case, Roland Pennington, equally high grade but of a quiet, phlegmatic temperament, showed how a defective mind works under suggestion, and the third case showed the crude brutality of a somewhat lower grade defective. The author makes it quite clear that all three were mental defectives, that all of them were of a mental age under twelve years, and that they did not know, and could not be expected to know, the quality of their acts. He points out that these cases are typical of a large proportion of criminal cases, and that their nature is not widely understood. A clear conception of the nature of the imbecile and of his relation to crime will inevitably result in a most desirable change in our criminal procedure.

At least two-thirds of mental defectives have inherited their defect, and the ultimate prevention of feeble-mindedness, and the solution of a large part of our prison problem, depends upon the prevention of the further propagation of this race of defectives. We must, accordingly, be on the look-out for mental defect in our schools. When discovered, such persons must be taken care of as carefully as if they had leprosy. All mental defectives are potential criminals, and we must save innocent members of society from being murdered, by placing such feeble-minded boys in confinement. We must, therefore, realise the importance and take the necessary steps to reduce the birth-rate of these mentally defective individuals. "Feeble-mindedness as related to crime may be exterminated in a few generations if we will but use our intelligence to attack this problem at its root."

This book deserves to be widely read, not only by those interested in feeble-mindedness, but by all those who study social problems, and especially by criminal lawyers. It will raise still higher the reputation the author has already gained for himself.

AN INTRODUCTION TO SOCIAL PSYCHOLOGY. WILLIAM
(213) M'DOUGALL, F.R.S. Ninth edition. Pp. xvii + 431. Methuen & Co. Ltd., London. 1915. Pr. 5s. net.

THE first edition of this book was published in October 1908, and has been followed each year by the appearance of a fresh edition, three of which have been revised. No one who was familiar with

the first edition will be surprised at the success which this work has met, as there is no book on this subject which we should sooner recommend. The author has a distinct style of his own, perfectly clear and unambiguous, with great power of expression and ability to explain his meaning clearly and in simple language.

After an introduction, the book is divided into two sections, the first dealing with the mental characters of man of primary importance for his life in society, and the second with the operation of the primary tendencies of the human mind in the life of societies. There then follow two supplementary chapters upon theories of action and the sex instinct. This latter chapter appeared in the eighth edition, and is of special interest, as it brings the author into criticism of the views of Freud. He expresses himself as follows: "Freud proposes to extend very greatly the sphere commonly attributed to sexuality in human life, assigning a sexual root to mental and nervous disorders of almost every kind, as well as to all dreams and to other processes of normal mental life that have no obvious connection with sex. It seems to me that this immense extension of the sphere of sexuality (which has excited acute opposition to Freud's doctrines and obscures for many the important and valuable truths contained in them) is in large part an error due to the neglect of the distinction between the sex instinct and the sentiment of sex love. For Freud and his disciples, taking the sentiment of sex love as the type of all love, regard as manifestations of sexuality all modes of behaviour and of feeling that are of the same kind as those that occur as phases in the life-history of this sentiment." Professor Freud "would explain the direction of the sex impulse of man towards woman by the assumption that the male infant derives sexual pleasure from the act of sucking at his mother's breast. It is, I submit, a sufficient refutation of this view to ask: How, then, does the sex instinct of woman become directed towards man? How explain the fact that homosexuality is not the rule in women?" "In attempting to form an opinion on this Freudian doctrine of infantile sexuality, it is important to remember that, even if we find ourselves compelled to reject it for the normal majority, it may be at least partially true of a minority. For, in regard to the most fundamental point at issue, namely, the age at which sexuality is to be attributed to the child, general biological considerations prepare us to find that individuals differ widely in this respect. It may well be that in an unknown proportion of human beings the sex instinct begins to be excitable at a very early age, while in others, probably the great majority, this occurs at a much later stage of development; and it is not improbable that the neurotic patients, on the

study of which the Freudian doctrine is chiefly based, belong to the minority, and that it is just this peculiarity of constitution that renders them liable to their disorders. In considering the question of infantile sexuality, we must therefore attach but little weight to the evidence of it drawn from the study of psycho-neurotic patients, and must rather weigh the positive indications for and against it provided by healthy persons."

We have quoted the above views at some length as they should prove of special interest to those interested in psycho-analytic problems, but they form only a small part of this book, which is, as its name implies, mostly concerned with social psychology. The chapters on the various instincts and the growth, development, and nature of the sentiments are expressed with such clearness that they cannot fail to prove of wide general interest. We cordially recommend this book as a masterly exposition of a subject deserving wide understanding.

THE INVESTIGATION OF MIND IN ANIMALS. E. M. SMITH. Pp. (214) ix + 194. Cambridge University Press. 1915. Pr. 3s. net.

THIS little book has been written for the purpose of presenting a brief account of the modes of procedure employed in animal psychology, a science which has for its object the systematic investigation of the brute mind, and to show the aims, trend, and general nature of the results hitherto obtained. Most people are able to relate some apparently striking instance of animal intelligence, but the majority of such cases will not stand a critical examination. This book may be regarded as an introduction to the subject, the method adopted being that of description and illustration followed by explanation, while discussion and controversial matter are avoided.

The opening chapter deals with protozoan behaviour, and concludes that though the activities of unicellular organisms reveal no irrefragable proof of the presence of mind, a study of their conduct suffices to exhibit at least a fundamental resemblance to so-called "intelligent" behaviour. Habit formation is then discussed, and some interesting labyrinth experiments (Hampton Court Maze) are described. It is shown that the rat, in such experiments, relies at first upon contact cues derived through the extero-ceptors (*i.e.*, the end-organs which receive impressions from the external world), but that later automaticity, characterising the acquired maze habit, is rendered possible by the transference of these cues, during learning, to kinæsthetic and organic ones derived from the proprio-ceptors (*i.e.*, the end-organs whose stimuli are the changes going on in the deep tissues of the organism), which ultimately assume complete dominance. Associative

memory and sensory discrimination are next discussed, due attention being paid to Pawlow's "conditioned" reflex experiments and the means they afford of determining the relative paucity or richness of an animal's sensory equipment, a determination which must be made prior to any extensive consideration of its higher "mental" processes. Instinct is next considered. Instincts are not infallible, and may be modified. They are independent of any external stimulus, in other words are self-dependent. They are thus not reflexes. Two aspects may be distinguished, the impulse and the satisfaction of the impulse. Whether an instinctive disposition shall function or remain inactive is largely determined by the chemical state of the organism, and especially by the internal secretions. Homing, as a particular instinct, is described at some length. Instinctive imitation as a factor in learning does not seem to be important. The last chapter deals with the evidence for intelligence and for ideas, and describes Thorndike's and other experiments, but unfortunately deals very briefly with the "thinking" horses of Elberfeld, and scarcely refers to the "talking" dog of Mannheim.

It is a good introduction to the subject of animal psychology, and should be read with interest.

PSYCHIATRIC BULLETIN of the New York State Hospitals. (215) Editors:—JAMES V. MAY, AUGUST HOCH, and GEORGE H. KIRBY. Annual Subscription, $2.00, single number .50. 1916.

THIS is a continuation of the *State Hospital Bulletin*, and will appear quarterly in January, April, July, and October. The reason of the change is on account of the increase in the importance of the latter journal, which has undergone a gradual change from a publication of more local to one of more general interest to psychiatrists. The editors feel that this change should be expressed not only in the content, but also in the external appearance of the journal, and in the title.

The January number consists of four original articles, all abstracted in this *Review* (pp. 134, 135, 125, 126), and thirteen abstracts or reviews of important papers in psychiatry. The general appearance of the number is most satisfactory.

BOOKS AND PAMPHLETS RECEIVED.

Goddard, H. H. "The Criminal Imbecile: An Analysis of Three Remarkable Murder Cases." Pp. 157. The Macmillan Co., New York, 1915. Pr. 6s. 6d. net.

M'Dougall, Wm. "An Introduction to Social Psychology." Ninth Edition. Pp. 431. Methuen & Co., London, 1915. Pr. 5s. net.

Smith, E. M. "The Investigation of Mind in Animals." Pp. 194. Cambridge University Press, London, 1915. Pr. 3s. net.

Review

of

Neurology and Psychiatry

Original Articles

TRANSIENT HEMIPLEGIA IN DIPHTHERIA.

By J. D. ROLLESTON, M.D.

HEMIPLEGIA of any kind is uncommon in diphtheria. Of 11,313 cases of diphtheria admitted to the Grove Fever Hospital between 17th August 1899 and 31st December 1915, only eight developed this complication. Two of these I described in this *Review* in 1905,[13] and in 1913,[15] at the Clinical Section of the Royal Society of Medicine, I reported another four, in one of which the hemiplegia was of only three hours' duration.

Since then Dynkin[5] has collected five, Leede[7] and Mollet[9] four each, and Auer[2] and Randegger[12] one each, which, added to the eighty cases collected by me in 1913, brings the total on record up to ninety-six, including the two described below.

With the exception of one of Leede's cases, and the one of my own already mentioned, in none of those hitherto published was the hemiplegia transient.

According to Levi[8] four made a complete recovery, but in spite of a careful search through the literature, the only case of the kind that I have been able to discover is that reported by Muratow[10] in a girl, aged 14 years, who developed right hemiplegia and aphasia on the fifteenth day, and made a complete recovery about a month after the ictus. The hemiplegia in her case was attributed to encephalitis. The following two cases of transient hemiplegia are the only examples of the kind I have seen in diphtheria.

Case I.—A girl, aged 6 years, was admitted to hospital with severe faucial diphtheria on 5th December 1910, on the third day of disease. With the exception of whooping-cough in infancy, she had had no previous illnesses. 20,000 units of antitoxin were injected on admission, and again on the following day. The throat became clean on 12th December.

The urine, tested on 6th December, was normal, but on the 7th and 8th contained a trace of albumin, and on the 9th a thick cloud, which persisted. The patient's general condition, however, remained satisfactory until 31st December, the twenty-ninth day of disease, when she vomited twice in the morning and twice in the afternoon. At 4.30 P.M. there were violent convulsive movements of the right arm and right leg. The plantar reflex was flexor. The heart was rapid, but otherwise normal. The pulse tension was increased. Phlebotomy was performed on the left arm, but not more than 5 oz. of blood could be withdrawn. The convulsive movements still continued, and at 5.30 P.M. lumbar puncture was performed. The cerebro-spinal fluid was under slight hypertension, but clear, and contained no cells or micro-organisms.

The convulsive movements ceased at 5.35 P.M. On examination at 4.15 P.M. there was flaccid right hemiplegia, with extensor response and absence of the abdominal reflex on the right side. The left abdominal reflex was active.

The child had not spoken since 3.45 P.M.

The temperature, hitherto subnormal since 9th December, was 100·6°. At 10.45 P.M. she could draw up her right leg, move her upper limb slightly, and answer in monosyllables.

The plantar response was now flexor, the abdominal reflex was present in the right side, but was less active than on the left.

She appeared unable to protrude her tongue, but opened her mouth when told to do so.

The following day the paralysis had entirely disappeared, but there was occasional extension of the right hallux on plantar stimulation.

The urine was almost solid on boiling.

The systolic blood pressure was 120 mm. Hg. Morning temperature, 98·4°. Evening temperature, 99°. On 2nd January the albumin was much less, but she complained of headache during the day, and the blood pressure was still 120 mm.

Generalised convulsions occurred at 8.10 P.M., and lasted for two hours. The temperature remained subnormal all day. On 3rd January there was some twitching of the left side. The child was now completely unconscious. The blood pressure had now fallen to 80 mm. Phlebotomy was performed, but only about 2 oz. of blood were withdrawn.

Lumbar puncture gave issue to 2 oz. of clear fluid under normal tension. Morning temperature, 107° F. Evening temperature, 102·4°. Death took place at 5.35 A.M. the following day. No autopsy could be obtained.

Case II.—A boy, aged 5 years, was admitted to hospital on 6th October 1915, with severe faucial diphtheria on the third day of disease. 20,000 units of antitoxin were given on admission, 16,000 on 7th October, and 12,000 on 8th October. Albuminuria was present from 8th October till 9th November. The throat became clean on 11th October. An urticarial rash appeared at the injection site on 12th October, and persisted till 15th October. The same day the heart, hitherto normal, showed some slight left-sided dilatation and an occasional extra-systole, and the child vomited. On 16th October triple rhythm developed, and the liver became enlarged. On 2nd November the voice became nasal. In the morning of 3rd November, the thirty-first day of disease, a circinate rash appeared on the limbs. Temperature, 97·8° F. During the day he complained of abdominal pain, and at 10 P.M. became very pale and almost pulseless.

At 1.30 A.M. on 4th November the face, eyes, and arms twitched, and between 4 A.M. and 6.40 A.M. he had general convulsions. At 11.20 A.M. he was found to have complete loss of power in the right upper and lower extremities. There was slight facial palsy. The right abdominal reflex was less marked than the left. Both plantar reflexes were flexor. There was no ankle clonus. The knee jerks were absent. He seemed to understand what was said to him, but could not speak. At 7 P.M. he had recovered some power in the right upper limb, but the lower limb was still paralysed. The right plantar reflex was now extensor. He could now speak a few words. The following morning he had quite recovered his speech, and could move his right arm and leg freely. The right plantar reflex was still extensor, but became flexor the next day. The temperature during the hemiplegia did not rise above 99·2°. The voice

remained nasal until 29th November, but no other nervous symptoms developed, and when he was allowed up on 3rd December, the sixty-first day of disease, he could walk without support.

Diphtheritic whitlows developed on three fingers of the left hand on the same day as the paralysis. Their true nature was not recognised until two and a half months had elapsed, when a culture of the lesion revealed the presence of diphtheria bacilli. Rapid healing followed injection of antitoxin. Owing to a severe attack of chicken-pox, which occurred on 26th January, the boy was not discharged from hospital until 13th March, so that he was under observation for a sufficiently long time for any further paralysis to develop, but no such event took place, and when shown at the Royal Society of Medicine on 24th March he was in excellent health.

In both these cases the hemiplegia, though complete and accompanied by aphasia and the characteristic changes in the reflexes, disappeared within twenty-four hours. Though one case recovered, and an autopsy could not be obtained on the other, it is probable that the pathogeny of the hemiplegia was different in the two cases.

The absence in the first case of any cardiac disturbance negatives the suggestion of embolism, while the thick cloud of albumin, high blood pressure, headache, vomiting, and convulsions are typical of uræmia.

The case, in fact, bears a striking resemblance to the two examples of transient hemiplegia occurring in scarlatinal uræmia which I reported in this *Review* some years ago.[14]

Uræmia in diphtheria is extremely rare, though massive albuminuria and diminution of the urinary secretion, sometimes amounting to anuria, are not uncommon in severe cases.

Baginsky, the greatest clinical authority on diphtheria, in the second edition of his monograph published in 1913,[3] states that in addition to two cases of uræmia in diphtheria reported by his assistant Cassel[4] in 1892, he has only met with two other cases. It is interesting to note that one of Cassel's cases and one of Baginsky's both developed right hemiplegia.

The following is a brief account of their two cases. Cassel's case: Girl, aged 4¾ years, severe faucial diphtheria, 4th day of disease. Urine contains blood and enormous amount of albumin.

11th day—Throat clean. Voice nasal.

12th day—Sudden onset of clonic convulsions occurring at fairly regular half-hour intervals. No paralysis. Heart sounds pure, but weak.

13th day—Attacks continue. Œdema of extremities. Ascites. Oliguria.

14th day—Right hemiplegia. Collapse. Death.

Necropsy—Slight œdema of pia mater of brain. Brain substance anæmic. No thrombosis or embolism. Venous sinuses full of blood. Parenchymatous nephritis.

Cassel attributed the hemiplegia to the toxic substances circulating in the blood in uræmia.

Baginsky's case was a child, aged 3 years, in whom severe nephritis was associated with cardiac thrombosis, which led to embolism in the lenticular nucleus. Death was preceded by hemiplegia and convulsions. Owing to its complicated nature, Baginsky admits that his case may perhaps not be one of true uræmia.

In my second case a different explanation of the hemiplegia may be given. The early involvement of the heart, characteristic of the malignant cases of diphtheria, was similar to that which I had noted in my other cases of diphtheritic hemiplegia, as well as in the case of extensive occlusion of cerebral arteries reported by Dr Gunson and myself.[16] Cardiac thrombosis, giving rise to cerebral embolism, seemed to be present, but unlike the other cases on record, the emboli were probably small, and the lesions easily reparable.

The case may thus be classified with those described by Achard and Lévi[1] in their paper entitled "Paralysies transitoires d'origine cardiaque."

According to these writers, midway between the transitory palsies due to uræmia or hepatic toxæmia, and the permanent paralysis due to a gross cerebral lesion, must be placed a class of intermediate cases consisting of paralysis of cardiac origin, the result of microscopical emboli.

In addition to the circulatory disturbance, a toxic element enters into the causation of these paralyses.

This theory of microscopical emboli appears to me to be a more probable explanation of the hemiplegia in this case than the condition of arterial spasm which has been brought forward by various writers as the cause of transient strokes in adults.

It is probable that Leede's case of transient hemiplegia, of which the following is a brief description, also belongs to the class described by Achard and Lévi.

The patient, a male, aged 18, was admitted to hospital on the second day of a very severe attack of faucial and nasal diphtheria. 10,500 units were given intravenously on admission, and 3,000 units subcutaneously on the following day. Cardiac dilatation, accompanied by enlargement of the liver and vomiting, occurred within the first fortnight, and on the twenty-first day complete right hemiplegia. Embolism of the left Sylvian artery was diagnosed, but on the following day the paresis had entirely disappeared. A slight pre-existent albuminuria developed into a severe nephritis, which cleared up entirely in a few days. Death took place on the twenty-third day from myocarditis.

The autopsy showed dilatation and fatty degeneration of the myocardium. No thrombi were found in the heart. Neither in the brain nor in the vessels at the base were there any pathological changes to account for the hemiplegia. Leede remarks that the rapid disappearance of the paresis is unusual, and can only be explained by a transient vascular disturbance.

The whitlow incident in Case 2 will be dealt with more fully elsewhere, but it is of some neurological interest that no nervous sequelæ attributable to this cause developed as in the cases recorded by Paterson[11] and by Guthrie,[6] in which diphtheria of the finger without faucial involvement was followed by extensive paralysis.

References.

[1] Achard and Lévi. *Bull. et mém. soc. méd. Hôp. de Paris*, 1897, 3 sér., xiv., p. 1139.
[2] Auer, E. M. *New York Med. Journ.*, 1915, ci., p. 956.
[3] Baginsky, A. "Diphtherie und Diphtheritischer Croup," 1913, pp. 248-49.
[4] Cassel, J. *Arch. f. Kinderheilk.*, 1890, xi., p. 1.
[5] Dynkin, A. L. *Jahrb. f. Kinderheilk.*, 1913, lxxviii., Erg.-Heft., p. 267.
[6] Guthrie, L. *Lancet*, 1894, ii., p. 1025.
[7] Leede, W. *Zeitschr. f. Kinderheilk.*, 1913, viii., p. 88.
[8] Levi, A. *Arch. f. Kinderheilk.*, 1897, xxii., p. 11.
[9] Mollet, A. *Thèses de Paris*, 1913-14, No. 264.
[10] Muratow, quoted by Dynkin, *loc. cit.*
[11] Paterson, A. R. *Med. Times and Gaz.*, 1866, ii., p. 608.
[12] Randegger, G. F. *Rev. de Clin. Pediatr.*, 1915, xiii., p. 488.
[13] Rolleston, J. D. *Rev. of Neurol. and Psychiat.*, 1905, iii., p. 722.
[14] *Id., ibid.*, 1908, vi., p. 530.
[15] *Id., Clin. Journ.*, 1913, xlii., p. 12.
[16] *Id.*, and Gunson, E. B. *Rev. of Neurol. and Psychiat.*, 1915, xiii., p. 373.

STUDIES IN SPEECH DISORDER, No. 5*—THE SPEECH IN ATHETOSIS.†

By WALTER B. SWIFT, A.B., S.B., M.D., Boston, Mass.,

In Charge Voice Clinic, Boston State Hospital, Psychopathic Department; Assistant in Laryngology, Special Clinic for Speech Disorder, Massachusetts General Hospital; Director of the Affiliated Speech Clinics.

If such fine movements as those in chorea can produce noticeable and analysable effects in the speech; (1) if such a slight lesion as a parasyphilitic involvement of the sensory neurone can produce signs with unique characteristics, (2) and if, as lately shown, (3) congenital syphilis can lend peculiar character to the voice, and so small a lesion as essential tremor can show an unmistakable voice sign, (4) surely the larger lesions and more marked diseases, that throw all the workings of the vocal mechanism into what seems a mass of vocal hodge-podge to the untrained ear, deserve analysis and investigation, recording and report.

Such a lesion is this one of athetosis, and a research on the vocal elements may be productive of a means to understand these poor creatures, and also a key to knowing just why they cannot talk. Let us then analyse this case.

Case.—Boy, 14, American, private school.

Complaint.—Undeveloped speech.

P.I.—Intertwining movements of arms, head, and legs. Boy cannot walk alone, lies down helplessly most of the time. Head motions interfere with speech, which has always been indistinct and now, though developed some in the last few months, cannot be understood by strangers. Vocabulary, 250 words.

History.—Mother says left side is weaker. Nurse says more difficult to dress on that side.

Contractions are severe in their strength, but never spastic or constant, ever changing one motion to another.

Nurse says knows records on victrola, and when one is put on and started he recognises at once the change.

* "Studies in Speech Disorder, No. 4.—Elimination of Speech Defects following Adenoid and Tonsil Operations." *Boston Med. and Surg. Journ.*, 1915, Nov. 18.

† Read 27th September 1915 at the Second "Authors' Evening" of ten papers, at the Voice Clinic, Psychopathic Hospital, Boston, Mass.

P.H.—Operation at Peter Bent Brigham Hospital for gland of neck, fall of 1914. Abstract of record.

F.H.—Birth long. Small pelvis, instruments. Supposed birth injury.

Physical Examination.—Heart, lungs, and abdomen are all negative. Chest wall slightly flatter on right than on left. General emaciation. Colour good. Musculature undeveloped. Genitalia small, little pubic hair, long foreskin, undescended testicles.

In sitting posture head flops back and to side, bodily motions all increased; head falls forward. Trunk also relaxed, not held. With effort, can sit straight but not hold it.

On effort to walk all contractions increase, both feet turn in, toes drag; left ankle weaker. Reminds one of diplegic case.

Reflexes.—Wrist jerk and elbow jerk normal during relaxation. Knee jerk likewise. Plantar right, elicits retraction and a complaint of hypersensitiveness.

Pupils react to light and distance, ocular movements all normal. Sensation normal to touch and pain over whole body.

Vocal Examination.—Voice in general consists of uncontrolled laughter that is varied by the motions of the mouth and jaw and throat consisting of a constant variation and change in every utterance that is attempted.

These motions are as follows:—

Pretty constant contraction of risorius muscle and other facial muscles near by. The jaw is often strongly and forcibly closed, again widely opened, accompanied by throat contractions; all these are made more intense with effort, either muscular or in speaking.

Between efforts there is considerable relaxation. These motions are still perhaps one-third of the time.

Vowels.—Are correctly sensed and carried over to the motor side, but find difficulty in the following vocal agents.

As soon as effort in enunciation begins, the contraction of muscles about the buccal cavity start their related motion.

This makes a constant change in cavities of mouth, and hence a constant variation in any utterances dependent on those cavities; *e.g.*, when told to say *ah* very plainly, he comprehends instructions, but on utterance there follows a gurgle of sounds caused by contraction of the muscles of the cavities.

Occasionally the *a* is sounded once with a change of cavity following. Again it is started with some other sounds and reaches the sound given when the contraction gets to the right place. He seems to realise when it is right, for then he stops effort.

Again, he will jump quickly at a sound; if he happens to be relaxed when instruction is given, as if seeking to get it out before contraction arrives. When it is right, then he stops effort at enunciation. When it is wrong, then he continues the sound until he strikes it, then stops. Once he tried three times before he got it right, and when he got it right, stopped. His first two trials were varied.

After some observation one can see that his vague stabs at utterance are along the right line, as in comparing *oo* and *ah*; for he never opens mouth wide when attempting to say *oo*, showing that he has some direction and control of utterance. And on trying to say *oo* has never opened his mouth wide, as though trying to say *ah*.

On giving vowels by threes gave first correctly and last one correctly.

Mother says he improves *oo* sound by preceding with *f* or *v* or *p* or *b*.

When given last three vowels he attempted to wait until there was relaxation, then shot them off all at once. Short vowels are markedly more difficult, *or* correct; others were not sounded during pretty severe contractions. Most of his vowel utterances consist in formal placing.

On trying to say *Harvard*; pretty constant throat, mouth and facial contractions, varying and change in cavities, but he watched for periods of relaxation, then sounded the word slowly with correct details.

Long Sentences.—Given the sentence: *The pussy cat went downstairs, turned around, and then went upstairs, and hid behind the kitchen door.* After three repetitions of this sentence carried the repetition of it from beginning to end and naming principal words, like pussy, downstairs, around, upstairs, kitchen door; dominated and vitiated throughout by constant cavity change and muscular contractions.

Whistle.—Absent. Nurse says with holding of mouth can whistle a little.

On being asked to sing "Tipperary" he tries to say the words,

but apparently fails. Nurse gives details about his recognising tunes.

On request to sound prolonged *a* makes three different attempts; one sounding *on*, another a long *a*, followed by *oo*; the third is *a e ow*; modifications all caught by contractions during effort.

On request to say *oo* prolonged, starts in, holds the standard sound spasmodically, while sound is forced off standard by contractions.

Consonants.—*P B M* correct.

At first put a *k*, then a *t* in place of *d*; then with great effort got a correct *d*.

Now says *cargo*.

Vague monotony and muffled nature dominates all his utterances.

F present replaces *V*. *V* heard.

TH, tongue placed correctly, but motions sidetrack utterance.

R and *L* not attainable. Nurse says he has *l*, but no *r*.

Bodily Contractions outside of the face consist of head, arm, and leg motions with the uniform characteristics in them all of an athetoid ataxic nature, *e.g.*, in arm he will suddenly flex at elbow, and markedly flex at elbow, then extend the whole arm with hand flexors contracted and finger extensors in spasm, holding the fingers out in a fan-like hyperextended attitude. Sometimes there is a hyperextension at elbow; other times whole arm is contracted at once, sometimes very severely; will occasionally hold a tight fist for several minutes.

Face, arm, and leg contractions may start independently, but they are often all together, one being more severe than the rest; one relaxed and the other two a third in severity, or all of them mildly contracting. Again, at their best, all three are in severe contractions and motion on both sides, rarely on one side alone.

Trunk shows contraction and relaxation with about the same frequency and severity as rest of body, without showing so much.

Contractions of mouth often result in gritting of teeth, which sometimes comes during utterance.

Throat Examination.—Buccal cavity wide and flat. Upper gum thick in front; two incisors next the centre lack growth and are set back; one little tooth coming in left lower jaw. Tongue is rather thick, uvula short.

Summary—We have here an extreme case of athetosis that shows in the vocal mechanism as a constant intertwining change of mouth positions so that all sounds are immediately varied into other forms of vowels; and other sounds, if consonants; their inter-relations are extremely varied. Speech is clear only when movements happen to take correct position; and the letter then sounded. In brief, athetoid speech is a constant variation in vowel form and consonant sound, clear only when correctly struck during the constantly changing contractions, or when, during rare moments of relaxation, the sounds are hit before contractions occur.

REFERENCES.

1. SWIFT, WALTER B. "A Voice Sign in Chorea." *Amer. Journ. Diseases of Children*, June 1914.
2. SWIFT, WALTER B. "Observations on the Voice in Tabes: A Voice Sign." *Amer. Journ. Insanity*, October 1915.
3. SWIFT, WALTER B. "Can the Speech Present a Sign of Congenital Syphilis?" *Boston Med. and Surg. Journ.*, October 21, 1915.
4. SWIFT, WALTER B. "The Speech in Essential Tremor." Unpublished.

Abstracts.

ANATOMY.

THE ARTERIES OF THE PONS AND MEDULLA OBLONGATA.

(216) —I. J. S. B. STOPFORD, *Journ. Anat. and Physiol.*, 1916, l., Jan., p. 131.

THIS investigation was undertaken to determine the precise blood supply of the hind brain. It was found necessary, in the first place, to study the gross anatomy of the arteries in a large number of brains before proceeding to make injections of coloured gelatine, as our knowledge of the exact course, relations, and variations of these vessels is so incomplete. Consequently the work was divided into three parts.

Part I.—The gross anatomy of the vessels, with special reference to their bulbar branches and relation to cranial nerves.

Part II.—The precise areas of the medulla oblongata and pons supplied by the individual arteries and their branches.

Part III.—The clinical significance of the two former parts.

Part I.

In this section of the work the vessels of 150 brains were examined, 33 of which were from cases of insanity, and these were found to show proportionately more anomalies and variations than the 117 sane cases.

A. Vessels in Relation to the Hind Brain.

The Vertebral Artery.—After piercing the dura this vessel lies between the most caudal rootlets of the twelfth nerve and the uppermost fibres of the first cervical. It then inclines antero-medially as it ascends anterior to the origin of the twelfth nerve, and usually meets the vessel of the opposite side in the region of the antero-median fissure at the lower border of the pons, where the two fuse to form the basilar. In 92 per cent. the arteries of the two sides were unequal, the left being larger in 51 per cent., and the right in 41 per cent., but in 20 per cent. the discrepancy in size was slight.

The right vertebral was excessively small in five cases, and both in one case.

There may be marked reduction in size at three points. In half the cases there was a distinct diminution in diameter immediately after piercing the dura; a second narrowing was to be found at the upper limit of the vessel, where the lumen was usually smaller than elsewhere. The third point of reduction in size was midway between the other two, and although only found four times on each side, was of clinical interest, as twice it marked the origin of the posterior inferior cerebellar artery, which was unusually large.

The vertebral arteries were found to form the basilar approximately at the lower border of the pons in 73 per cent., above that point in 8 per cent., and below in 19 per cent. The only anomalies encountered were three instances of reduplication of the artery of one side for a short portion of its course; in one the rootlets of the twelfth nerve passed through the aperture formed by the reduplication.

Branches of the Vertebral Artery.

1. *Bulbar.*

A. An upper set arising from the dorsal aspect of the vessel just caudal to its termination. They enter

the bulb either in the antero-median fissure or antero-lateral fissures, or else in the groove marking the junction of medulla and pons.

B. An intermediate set, arising from the lateral aspect of the vertebral, about the mid-olivary region, and entering the postero-lateral fissure. They vary in size and number proportionately to the bulbar supply of the posterior inferior cerebellar.

C. A lower set, consisting usually of one moderately large branch, which arises from the medial aspect of the vertebral whilst it is in relation to the lateral aspect of the medulla, and at once subdivides into a number of fine twigs which enter the lower part of the bulb.

2. *Anterior Spinal Artery.*—This artery usually arises by two delicate branches, one from the medial side and upper part of each vertebral, which unite on the pyramids below to form one median branch, or continue as two separate vessels after anastomosing. The right branch of origin was absent in 9 per cent., the left in 3 per cent., and the vessel arose by one stem from the junction of the two vertebrals in 3 per cent. The right was slightly larger in 43 per cent., and the left in 46 per cent., the two being approximately of equal calibre in 11 per cent. The origin in 51 per cent. on the right and 59 per cent. on the left was in the region of the cephalic extremity of the olivary eminence; in 29 per cent. on the right and 28 per cent. on the left the origin was about the level of the mid-olivary region, and in 20 per cent. on the right and 13 per cent. on the left it was at the level of the caudal extremity of the olive, or slightly below it. The site of origin of the anterior spinal influences the area of the medulla supplied by the vertebral.

In 6 per cent. the right and left branches of origin remained separate, but in the remainder there were one or more transverse communications between the two, or else they fused to form one median trunk. The site of the communication or fusion was about the level of the lower end of the olive in 63 per cent., and almost at the junction of the bulb and spinal cord in 31 per cent.

Bulbar Branches.

A. A set of branches from the two stems of origin before fusion. They break up and terminate on the upper part of the pyramids.

B. Branches from the median vessel (or vessels) after fusion, which pass directly into the antero-median fissure.

C. Branches from the same origin as the latter which pass lateral on the pyramids, and after repeated division penetrate the pyramids or antero-lateral fissure.

3. *The Posterior Inferior Cerebellar Artery.*—The precise anatomy of this vessel is now of great clinical importance, and yet the vaguest references are generally made to its course and origin. It is the largest branch of the vertebral, in three cases being larger than the parent vessel, and arises from its lateral side about the lower end of the olive. After curving round the lower border of the olive it ascends in the region of the postero-lateral fissure, usually posterior to the fila of the tenth and ninth nerves, almost to the lower border of the pons, where it turns downward, forming a loop with its convexity toward the pons. It then descends, with a slight inclination toward the mid-dorsal line, on the restiform body to just caudal to the calamus scriptorius, where it turns outward on to the vallecula to divide into its fully described lateral and medial branches for the supply of the inferior surface of the cerebellum. For practical purposes, it may be said this normal course was found in 64 per cent. on the right, and 68 per cent. on the left. In 5 per cent. on the right and 4 per cent. on the left the vessel passed almost directly dorsally without forming a loop. In 31 per cent. on the right and 29 per cent. on the left it passed dorsally and caudally, and failed to supply any bulbar branches. The vessel was absent in 15 per cent. on the right, 6 per cent. on the left, and in 3 per cent. on both sides; in which cases the bulbar branches were provided by the vertebral and the cerebellar branches by the anterior inferior cerebellar artery. The vessels of the two sides were equal in size in 22 per cent., and the right and left were each larger in 39 per cent. In one the left was four times the size of the right, and in another three times as large.

The origin previously described was found in 68 per cent. on the right and 74 per cent. on the left. In 12 per cent. on the right and 9 per cent. on the left it arose slightly above, and in 17 per cent. on both sides its origin was considerably caudal to the olive.

Four anomalies were seen. In the first two the vessel had a common origin with the anterior inferior cerebellar, in the third a double origin from the vertebral, and in the fourth a small foramen was found.

Branches.

A. *Bulbar.*—The ascending limb supplies two to seven minute branches to the region of the postero-lateral fissure, whilst the descending limb provides a variable number for the portion of medulla it is in relation with.

B. Cerebellar.

C. Choroidal.—This branch to the plexus of the fourth ventricle usually arises in the region of the cerebello-pontine angle.

D. Posterior Spinal.

4. *Posterior Spinal Artery.*—This artery was found to be a branch of the posterior inferior cerebellar in 73 per cent. on both sides, and sprung from the vertebral in 18 per cent. on the right and 20 per cent. on the left. In 9 per cent. on the right and 7 per cent. on the left it was found to be in communication with both the vertebral and the posterior inferior cerebellar. It was seen to arise from the posterior inferior cerebellar just before that vessel passed on to the cerebellum, and at once divided into ascending and descending branches, although the former was very inconstant. It was found to give numerous minute branches to the posterior columns and their nuclei.

Basilar Artery.—This artery extends from the caudal to the cephalic borders of the pons in the cisterna pontis. The median groove on the ventral aspect of the pons is produced by the pyramidal bundles on each side, and not by the pressure of the artery, as demonstrated by the persistence of the groove when the vessel is deflected from the middle line.

In four cases the vertebral appeared to be formed almost entirely by the right vertebral, and in a similar number by the left.

At its origin it was larger than either vertebral, but it gradually diminished in size during its course. It was found to maintain a constant course more frequently than any other vessel, but was seen to exhibit manifestations of arterial disease more frequently than the others.

In one instance a foramen was discovered near its origin.

Branches.

1. *Pontine.*

A. A median set composed of small branches, which enter the pons along the median groove.

B. A set of transverse rami which extend laterally, and subdivide into smaller branches which penetrate the surface of the pons at right angles to the parent vessel. They are probably arranged segmentally. A large one usually passed to the fifth nerve.

2. *Anterior Inferior Cerebellar Artery.*—This vessel arose from the lower third of the basilar in 75 per cent. on the right and 73 per cent. on the left, from the middle of the basilar in 16 per

cent. on the right and 21 per cent. on the left, and the lower limit of the basilar in 9 per cent. on the right and 6 per cent. on the left. The artery extends laterally to the cerebellum on the pons, and passes between it and the seventh and eighth nerves. The relation it bears to the sixth nerve is of clinical importance. The artery was found in the ventral position on both sides in 74 per cent., and in the dorsal in 8 per cent. Taking into account those cases where the neuro-vascular relationship differed on the two sides, the vessel was ventral on the right in 86 per cent., and on the left in 81 per cent. When the artery is dorsal (14 per cent. on the right, and 19 per cent. on the left), it may compress the nerve against the basi-sphenoid under certain conditions. On two occasions on the left the artery pierced the nerve.

Branches.

A. Pontine.—For the caudal and lateral part of the pons.
B. Bulbar.—In a few these were found to pass to the upper part of the postero-lateral sulcus.
C. Internal auditory.
D. Cerebellar.

3. *Internal Auditory Artery.*—It arose from the anterior inferior cerebellar, instead of the basilar, in 64 per cent. on the right and 62 per cent. on the left.

It is quite small, and only comes into relation with the sixth nerve when it arises from the basilar (36 per cent. on the right and 38 per cent. on the left), and in these passes dorsal to the nerve in 10 per cent. on the right and 16 per cent. on the left.

Branches.

A. The main vessel supplies the seventh nerve and the internal ear.
B. Occasionally a few bulbar, pontine, and cerebellar branches are found.

4. *Superior Cerebellar Artery.*—This vessel is very regular, and arises from the basilar close to its bifurcation. After extending laterally immediately caudal to the third nerve, it curves round the crus cerebri to gain the superior surface of the cerebellum. On the surface of the cerebellum the three cerebellar arteries freely anastomose together. Diminution in size, or absence, of one or other cerebellar artery is invariably provided for by an increase in calibre of one of the others, so that there appears to be a compensatory provision for the supply of a more or less constant volume of blood.

The superior cerebellar was found to be double in 12 per cent. on the right, 16 per cent. on the left, and in 3 per cent. on both sides.

Branches.

A. Pontine.
B. Mesencephalic.
C. Cerebellar.

5. *Posterior Cerebral Artery.*

B. The Circulus Arteriosus.

A complete circular anastomosis was found in 93 per cent.; in 6 per cent. one or other posterior communicating artery was absent. One would expect this to be the vessel most frequently absent, because it attains its maximum functional importance very early, but soon loses it owing to the development of the anastomosis between the posterior cerebral and the basilar.

Posterior Cerebral Artery.—The size of the origin of this vessel was inversely proportionate to the size of the posterior communicating in all (except one case).

The size of the origin was equal on the two sides in 32 per cent.; the right was larger in 36 per cent. and the left in 32 per cent. The artery appeared to arise chiefly from the internal carotid on both sides in 20 per cent., on the right only in 5 per cent., and on the left only in 3 per cent. In one case the posterior cerebral sprang from the internal carotid alone, owing to the failure of its normal post-fœtal origin from the basilar.

In one case there was the rare anomaly of reduplication of the posterior cerebral.

Normally the vessel passed anterior to the third nerve, but it was only in actual contact in 5 per cent. In four instances the bifurcation of the basilar was so caudal that the posterior cerebral had to make a pronounced curve round the third nerve, and consequently endanger it by strangulation, if any force acting in a caudal direction was exerted upon the vessel.

Posterior Communicating Artery.—This branch of the internal carotid was absent in 4 per cent. on the right and 3 per cent. on the left. In 35 per cent. the right was larger, in 37 per cent. the left, and in the remainder the vessels of the two sides were of equal size. Both were abnormally large in 3 per cent., and the vessel of either side alone was of extreme size in 1 per cent. Both were minute in 3 per cent., and the left alone was particularly small in 2 per cent. On both sides in 20 per cent. the posterior communicating was larger than the origin of the posterior cerebral from the basilar.

Anterior Cerebral Artery.—No marked abnormality of this vessel was noted. The relative size is of little clinical importance, owing to the constancy of the presence of the anterior communicating.

In 6 per cent. a middle anterior cerebral was discovered.

Middle Cerebral Artery.—No abnormal origin or size of this artery was seen.

Anterior Communicating Artery.—A communication between the two anterior cerebral arteries was constantly found. A normal single channel was seen in 85 per cent., a double communication (partial or complete) in 9 per cent., and in 3 per cent. there was lateral fusion for a short distance without the intervention of any communicating branch. In one case there was an anastomotic network between the two anterior cerebral arteries.

Internal Carotid Artery.—The only important point noted with regard to this vessel was its close approximation to the lateral side of the optic nerve.

The Frequency of Anomalies in Criminals and the Insane.—In the 117 brains from sane individuals anomalies were found in 61 per cent., whereas in the 33 from insane, anomalies were seen in 79 per cent. AUTHOR'S ABSTRACT.

GENERAL HISTOPATHOLOGY OF THE FIBRILLARY NEU-
(217) **ROGLIA OF THE CEREBELLAR CORTEX.** ASCANIO ARETINI, *Rassegna di Studi Psichiat.*, 1916, vi., Gennaio-Febbraio, p. 3.

ACCORDING to the observations of the author, all parts of the cerebellum can take part in the neuroglia reaction. The molecular layer, however, appears to be the region where gliosis develops best. The medullary layer does not possess such a strong capacity of reaction, and the granular layer exhibits this still less. The top and bottom of the convolutions, especially those in which vessels are situated, are the places where this gliosis appears most frequently. The glia reactions in the cerebellar cortex are similar in character to those already described for the cerebral cortex. The particular structure of the cerebellar cortex may modify this glia reaction in particular parts.

The author specially emphasises the point that it is uncertain if the so-called Bergmann fibres should be considered as normal elements of the cerebellar cortex, as an increase in these fibres, generally passing through the molecular layer in a radial direction, is a typical feature of cerebellar gliosis. The Bergmann fibres may have their origin from the tangential glia cells as well as from those termed epithelial. A. NINIAN BRUCE.

MORPHOLOGY OF THE ROOF PLATE OF THE FORE-BRAIN
(218) **AND THE LATERAL CHOROID PLEXUSES IN THE HUMAN EMBRYO.** PERCIVAL BAILEY, *Journ. Comp. Neurol.*, 1916, xxvi., Feb., pp. 79-120 (31 figs.).

THE lateral choroid plexuses are composed of two distinct portions, of which the anterior is developed from the roof plate in the angle between the paraphysal arch and the medial wall of the hemisphere, and the posterior from that part of the medial wall of the hemisphere just anterior to the di-telencephalic groove and homologous to the anterior limb of the velum interpositum.

The tænia fornicis of adult human anatomy, except for its extreme anterior end, is not homologous with the tænia fornicis of Anura. The position of the recessus neuroporicus could not with certainty be ascertained, and identification of the lamina supraneuroporica was therefore uncertain. The tela choroidea telencephali is present in the embryos of 28 and 32 mm.

The paraphysal arch can be followed to the embryo of 32 mm. as an arch of the roof plate of the telencephalon. It lies just anterior to the velum transversum, and from its sides arise the lateral choroid plexuses. The anterior pouch of the choroid plexus of the third ventricle lies in the diencephalon, and is not, therefore, homologous to the paraphysis of the lower vertebrates. No indication of the development of a glandular structure was found.

The velum transversum can be traced up to the 32 mm. embryo, joining the anterior extremities of attachment of the tela chorioidea diencephali to the lateral thalamic wall, and its groove is continuous laterally with the angle between the tænia chorioidea and the lateral thalamic wall, the diencephalic groove.

The tela chorioidea diencephali is not folded nor vascularised, except for its extreme anterior end in the embryo of 32 mm.

The epiphyses of all three embryos show indications of the presence of the homologue of the pineal vesicle of the lower vertebrates. In the embryos of 28 and 32 mm., the tela chorioidea diencephali is continued on to the epiphyseal outgrowth. There is evidence that the connection of the corpus striatum and thalamus is thickened by fusion of the medial root of the corpus striatum with the anterior extremity of the thalamus in the foramen interventriculare. A. NINIAN BRUCE.

PHYSIOLOGY.

ON LOCALISATION OF FUNCTION IN THE CANINE CERE-
(219) **BELLUM.** ERNEST G. GREY, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Feb., p. 105.

BOLK has demonstrated the functional relationship existing between the muscular system and the cerebellum, and has shown that variations in certain divisions of the cortex accompany similar variations in corresponding muscle groups. Rynberk has experimentally confirmed Bolk's anatomical conclusions, and has shown that circumscribed ablations of the cerebellar cortex involving specific lobuli produced specific and consistent post-operative motor phenomena. A short review is given of the work of others, and then an excellent description is given of the surgical technique involved, and a careful series of operations, consisting of ablation of different areas of the cerebellum, are detailed. In connection with these ablations it was demonstrated that recognisable changes occurred in corresponding muscular provinces, but these were neither marked nor of long duration, owing apparently to the capacity of cerebral function to compensate, in some degree at least, for any loss of cerebellar function. Another series of experiments was therefore carried out in which the cerebellar lesions were combined with sensori-motor destructions.

The author's conclusions are as follows :—

(1) The question of a localisation of function in the cerebellar cortex is still in dispute. The results of these experiments tend to support such an hypothesis.

(2) Previous investigations have shown that the gradual amelioration of symptoms which follows removal of the cerebellum does not occur in animals in which the sensori-motor spheres of the cerebrum have also been destroyed. When the sensori-motor areas are destroyed some weeks subsequent to a primary ablation of the crus secundum (lobulus ansiformis), or the lobulus simplex of the cerebellum, the symptomatic evidences of the latter injury which have subsided reappear once more and persist over a long period. The results of these experiments accordingly indicate the value of this combination of lesions in the study of canine cerebellar localisation. D. K. HENDERSON.

POSTURAL ACTIVITY OF MUSCLE AND NERVE. C. S. SHERRING-
(220) TON, *Brain*, 1915, xxxviii., p. 191.

SHERRINGTON believes that muscular tonus is for the most part reflex, and then postulates the statement that to know the

biological purpose of such a reflex is to have suggestions for lines along which to investigate it.

The tonus of skeletal muscle can be well studied in the cat after removal of the brain from the posterior colliculi forwards, which provides an excellent tonic preparation of the extensor muscle of the knee. Sherrington shows that in this muscle, and in other muscles exhibiting tonus, that the tonus is dependent on the afferent fibres from the dorsal roots. "In each case the tonus of these muscles requires the afferent fibres of the tonic muscle itself, and in the decerebrate cat preparation no other afferent fibres than those of the tonic muscle itself are actually essential for the exhibition of the tonus." Furthermore, Sherrington shows that the distribution of the tonus follows a plan of strict co-ordination, and is also markedly present in the trunk, neck, caudal region, and head. It is not present in those muscles which bend the spine downwards, droop the neck and tail, flex the head, depress the jaw. Tonus, therefore, is present in those muscles whose contraction tends to keep the animal in the erect position, and is absent in the antagonistic muscles; "the reflex tonus is postural contraction." Experiments and facts are also quoted to show that muscle still maintains the same degree of tension, no matter whether the muscle is lengthened or shortened.

In connection with visceral muscle, the experiments of Mosso and Pellaceni on the urinary bladder are examined, and it is shown that the tonus of the organ shows practically no alteration either when it is full or nearly empty. Sherrington then points out the close relationship of such a method of reaction to the reactions of skeletal muscles, and believes that it is conducive to clearness to think of such a mode of reaction in terms of postural contraction of muscle. The same phenomenon is also exhibited by the stomach, and by the muscles of the circulatory system.

Since then, both striped and unstriped muscle is able to exert approximately the same amount of tension, irrespective of the amount of contraction or relaxation of the muscle. Sherrington maintains that the term "tonus" is equivocal, and that it is more preferable to speak simply of postural activity.

In conclusion, the main characters of the action of muscle functioning posturally are discussed. D. K. HENDERSON.

ON MUSCLE TONUS. J. H. LANGELAAN, *Brain*, 1915, xxxviii., (221) p. 235.

A VOLUMINOUS report of experimental work which cannot well be abstracted. D. K. HENDERSON.

REGARDING THE EXISTENCE OF THE "COMMON CHEMICAL
(222) **SENSE" IN VERTEBRATES.** W. J. CROZIER, *Journ. Comp. Neurol.*, 1916, xxvi., Feb., p. 1.

THERE is positive evidence, in the case of alkalies, acids, and certain salts, that solutions supplying stimuli for the common chemical sense do not penetrate the skin of aquatic animals, nor when applied from a pipette do they damage the skin to any extent.

There is consequently no ground for Coghill's assumption that the cells of the germinative layer of the epithelium of fishes and amphibians are exposed to the action of the stimulating agent and thereby disrupted; and there is no histological evidence of disruption.

The reactions attributed to the common chemical sense depend upon a group of sense organs distinct from those sensitive to mechanical stimulation. A. NINIAN BRUCE.

EXPERIMENTAL STUDIES ON GROWTH.—I. METHODS. T.
(223) BRAILSFORD ROBERTSON and L. A. RAY, *Journ. Biol. Chem.*, 1916, xxiv., March, p. 347.

I. METHODS employed in experiments on the growth of mice hereafter detailed are described by which the animals may be maintained in good health, and as free as possible from zymotic disease and other deleterious factors in the environment which might conceivably exert an effect upon their growth. Improved forms of cages, food receptacles, and nest houses are described.

Rapid methods of handling and weighing large numbers of animals, and a balance especially adapted to this purpose, are also described. A. NINIAN BRUCE.

EXPERIMENTAL STUDIES ON GROWTH—

(224) **II. THE NORMAL GROWTH OF THE WHITE MOUSE.**

III. THE INFLUENCE OF THE ANTERIOR LOBE OF THE PITUITARY BODY UPON THE GROWTH OF THE WHITE MOUSE.

IV. THE INFLUENCE OF TETHELIN, THE GROWTH-CONTROLLING PRINCIPLE OF THE ANTERIOR LOBE OF THE PITUITARY BODY, UPON THE GROWTH OF THE WHITE MOUSE. ON THE ISOLATION AND PROPERTIES OF TETHELIN, THE GROWTH-CONTROLLING PRINCIPLE OF THE ANTERIOR LOBE OF THE PITUITARY BODY.

T. BRAILSFORD ROBERTSON, *Journ. Biol. Chem.*, 1916, xxiv., March, pp. 363, 385, 397, and 409.

II. A RECORD of the growth and variability of the white mouse as determined from birth to the end of the sixtieth week, under

conditions and with stock exactly resembling those employed in the subsequent experiments.

III. The administration of 0·125 gm. per day per animal of fresh anterior lobe pituitary tissue to mice, beginning at four weeks after birth (conclusion of the second growth cycle), leads to retardation of growth during the earlier portion of the third growth cycle, between the sixth and twentieth weeks. In the latter part of the third growth cycle, however, from the twentieth to the sixtieth weeks after birth, the growth of the pituitary-fed animals is markedly accelerated, so that they not only catch up to the normals, but actually, at about one year of age, come to surpass the normals in weight.

The effect of the pituitary tissue upon the variability of the weight of the animals is similar to its effect upon the velocity of their growth. The variability is diminished in the earlier portion of the third growth cycle, particularly between the tenth and twentieth weeks. Between the twentieth and sixtieth weeks the variability curves approach those of the normals, and intersect about the fortieth or fiftieth week.

Pituitary-fed animals, from about the thirtieth week onwards, appear more compactly built than normal animals. The pituitary-fed animals, weight for weight, are smaller than the normals of the same age, and size for size they are heavier.

Pituitary-fed males are noticeably more belligerent in their habits than normal males.

IV. From the concentrated alcoholic extract of dried anterior lobes of ox pituitaries a substance may be precipitated by the addition of one and one-half volumes of dry ether. This substance has been named *tethelin*. The effects of tethelin upon the growths of white mice resemble in every particular the effects of the administration of the whole anterior lobe. These effects consist in marked retardation of the first portion of the third growth cycle, followed by acceleration of the latter portion of the third growth cycle. The variations in weight of the tethelin-fed animals, like that of the pituitary-fed animals, is less than that of normals of the same age. Adult tethelin-fed animals, like adult animals which have been fed upon the anterior lobe of the pituitary body, are more compact in form and build than normal animals of the same age. Weight for weight the tethelin-fed animals are smaller than the normal ones, and size for size they are heavier. The coats of adult male animals which have been fed with tethelin, even at 14 months of age, have the glossy, silky appearance of the coats of young animals. Normal males, even 6 months prior to this age, have shaggy, staring, and discoloured coats. This improvement of the coats was not observed in the pituitary-fed

animals. Tethelin-fed animals do not display the remarkably enhanced belligerency which is exhibited by pituitary-fed animals.

Tethelin, the growth-controlling principle of the anterior lobe of the pituitary, is soluble in water, ethyl alcohol, ethyl ether, chloroform, and carbon tetrachloride. It is insoluble in a mixture of one part, by volume, of absolute alcohol and one and one-half parts of dry ether. It contains 1·4 per cent. of phosphorus and 4 atoms of nitrogen for every atom of phosphorus. It probably contains an iminazolyl group, and to this extent may be regarded as being related to the physiologically active substances of the posterior lobe of the pituitary body. It does produce, on intravenous injection, diuresis and only a transient fall in blood pressure.

A. NINIAN BRUCE.

THE EFFECTS OF TETHELIN. Acceleration in the recovery of
(225) **weight lost during inanition and in the healing of wounds.** T. BRAILSFORD ROBERTSON, *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 1, p. 1009.

EXPERIMENTAL results indicate that tethelin, the growth-controlling principle isolated from the anterior lobe of the pituitary body, exerts, when administered hypodermically to mice, a remarkably stimulating action on tissue repair, as expressed in the replacement of tissue lost during a preceding period of inanition or in the healing of granulating wounds.

A. NINIAN BRUCE.

PSYCHOLOGY.

WHAT BECOMES OF THE CHILDREN WHO PASS OUT OF
(226) **THE SPECIAL CLASSES? (Que deviennent les élèves qui sont sortis des classes d'anormaux?)** VALÉRIE DE MORSIER, *Archiv. de Psychol.*, 1915, xv., Dec., p. 379.

WE have not yet much information relative to the future life of children who have passed through the "Special Class." Hence this brief account of the results observed in the Canton of Geneva, where special classes were started in 1898, is of interest. According to the tables given, about 50 per cent. of the pupils in these classes have been able to return to the ordinary classes, while approximately 20 per cent., though never fit for ordinary school instruction, were yet able to make their own living.

MARGARET DRUMMOND.

THE PSYCHOLOGY OF GRAPHITES. (La psychologie des graffiti.)
(227) ALBERT LECLÈRE, *Archiv. de Psychol.*, 1915, xv., Dec., p. 321.

THE inscriptions and drawings found in public places may be considered from the point of view of content and from the point

of view of aim. With respect to content they may be divided under five heads:—1. Names inscribed in places of public resort. 2. Lovers' initials, or merely a date. 3. Inscriptions by soldiers, prisoners, or others looking forward to the termination of a certain period of time. 4. Judgments on individuals or expressions of political opinion. 5. Pornographic inscriptions.

Some inscriptions spring simply from imitation. Some belong to the realm of pure literature; that is, they arise from a need for self-expression, and are not written with a view to others. They are akin to the *journal intime*. Others again have their root in exhibitionism or in the journalistic tendency. All such productions save those of children, in which case they are merely a game, indicate an inferior mentality.

The writer concludes by pointing out the moral harm which inscriptions may do, and with a plea that we should defend our young people more vigilantly against a subtle form of evil suggestion.

MARGARET DRUMMOND.

A NEW METHOD IN RELIGIOUS PSYCHOLOGY. (**Une nouvelle** (228) **méthode en psychologie religieuse.**) M. E. MOLNAR, *Archiv. de Psychol.*, 1915, xv., Dec., p. 354.

THE new method referred to is to study the fluctuations in the religious life of individuals by means of specially prepared charts on which every hour a mark is made in accordance with the state of the inner life. A similar chart dealing with the practical life —the energy with which work is done, &c.—is also filled up. A journal explains the irregularities in the resulting curves. Three cases are studied in detail, the charts being reproduced.

MARGARET DRUMMOND.

SYMBOLISM. WM. A. WHITE, *The Psychoanalytic Review*, 1916, Jan., (229) p. 1.

A VERY general and confused account of the part played by symbolism in mental activity. No attempt is made clearly to distinguish the various forms of mental processes to which the name of symbolism has at different times been given. In one passage the author writes:—"The fundamental principle of symbolism is that anything may symbolise anything else. . . . It may mean one thing at one time, and another thing at another time; it may mean one thing to one person, and another thing to another person; it may or it may not have the usual significance." Yet in another he writes:—"When we deal with the symbolism of the

unconscious we are dealing with matter that is never individual, and in the proportion that we sound the ultimate depths of the unconscious do we approach a symbolism which is universal in meaning." It is clear that the author is here using the term symbolism in totally different senses, without distinguishing between the two. Many interesting examples of symbolism are given, drawn from diverse fields of sanity and insanity.

ERNEST JONES.

CLINICAL NEUROLOGY.

THE VALUE AND MEANING OF THE ADDUCTOR RESPONSES

(230) **OF THE LEG.** A. MYERSON, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Feb., p. 121.

WITH an ordinary Taylor reflex hammer, and using force that does not invoke pain, an attempt has been made to invoke adductor reflexes by stimulation of the following sites: (1) the internal surface of the knee joint; (2) the middle of the shaft of the tibia; (3) the external surface of the knee joints; (4) the internal malleolus; (5) the sole of the foot near the arch; (6) the tendo Achillis; (7) the anterior superior spine; (8) the patellar tendon.

These reflexes have been studied in healthy subjects, in fatigue states, and in certain disease states.

The only adductors presenting themselves in health are those from the internal condyle, the middle of the shaft of the tibia, the contralateral from the sole of the foot, and homolateral response from the Achilles tendon. These are present in a relatively small proportion, are not marked in activity, and the reflexogenous zones are usually sharply circumscribed. The responses from the external condyle, the anterior-superior spine, and the patellar tendon are not found in normal subjects.

Complete muscular fatigue was found to cause the disappearance of the responses.

So far as disease states are concerned, nothing new is added to our present knowledge.

The author emphasises the fact that the direction of the blow has a great deal to do with the type of response, and it seems possible that the stimulation which brings about the adductor response is indirect in its application. "For the present I wish to state that I believe that the real afferent limb of the arc arises either at the hip or in the pelvis, and not at any one of the sites stimulated."

D. K. HENDERSON.

UNMYELINATED NERVE-FIBRES AS CONDUCTORS OF PROTO-
(231) **PATHIC SENSATION.** S. W. RANSON, *Brain*, 1915, xxxviii., p. 381.

A TRIBUTE is paid to the work of Head and his associates, who showed that cutaneous sensation could be separated into two groups, which they called "protopathic" and "epicritic." The author agrees with Head's assumption in explanation of this differentiation that there are two kinds of afferent nerve-fibres which differ slightly in their anatomical distribution. Ranson now advances the hypothesis that the myelinated afferent fibres may be responsible for epicritic sensation, and the unmyelinated for protopathic sensation.

Using a "pyridine silver technique," Ranson has shown that the spinal nerves contain great numbers of unmyelinated fibres which apparently arise from the small cells of the spinal ganglia. The unmyelinated fibres of spinal nerves are distributed chiefly to the skin, but some go with the muscular branches of the nerves, which would account for the sense of pain in the muscles, joints, and other deeply situated parts.

The myelinated and unmyelinated fibres are not distributed equally in all cutaneous nerves, and there would seem to be a direct relation between the sharpness of epicritic sensation and the proportion of myelinated fibres in the associated nerve.

From the rate of regeneration of unmyelinated afferent fibres, from certain facts in regard to visceral sensation, and from the distribution of the unmyelinated fibres in the spinal cord, evidence is deduced to show that protopathic sensation may be conveyed by unmyelinated fibres. D. K. HENDERSON.

A CASE OF HERPES ZOSTER PRESENTING MULTIPLE
(232) **SYMPTOMS, AND AT ONE TIME SIMULATING MAS-TOIDITIS.** J. WEINSTEIN, *Med. Record*, 1916, lxxxix., p. 194.

A WOMAN, aged 20, was taken ill with sore throat. After an interval of two weeks, during which she felt fairly well, she began to complain of pain in the head, and especially behind the ears. Tenderness and œdema were found over both mastoids, and the next day the œdema had extended on to the frontal region, involving both eyelids of the right eye, and vesicles appeared in this region. Weinstein suggests that what was at first regarded as a subsiding tonsillitis and pharyngitis was really a primary involvement of the ganglia of ix. or x. The secondary manifestations in the mastoid region may have indicated an involvement of other ganglia of the chain (geniculate, second, third, or fourth cervical ganglia), or may have been simply referred symptoms. J. D. ROLLESTON.

SPEECH CONFLICT—A NATURAL CONSEQUENCE IN COSMO-
(233) **POLITAN CITIES—AS AN ETIOLOGICAL FACTOR IN STUTTERING. PRELIMINARY REPORT BASED ON 200 CASES.** MAY K. SCRIPTURE and OTTO GLOGAU, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 37, and Feb., p. 139.

A STATISTICAL study on the etiology of stuttering founded on the last 200 cases of stuttering admitted to the neurological department of Columbia University, New York. The article is devoted to a study of the nationality of the patients, and the apparent conflict of language due to the overwhelming majority of foreign-speaking parents whose children, in learning English, develop a stuttering habit. In 38 out of the 200 cases the etiological factor seems to have been due to a conflict between the mother tongue at home and English to be learned in school. In these cases the age of onset of the stuttering was on an average between the fifth and seventh year. This speech conflict is almost exclusively met with in the Yiddish child, and particularly in the male sex.

Speech clinics, teachers who have a fair knowledge of the disturbances of speech, and special classes in schools are all desirable in dealing with these children. D. K. HENDERSON.

THE VOICE SIGN IN TABES—TECHNIQUE OF ELICITA-
(234) **TION. STUDIES IN NEUROLOGICAL TECHNIQUE, No. 5.** WALTER B. SWIFT, *Review of Neurology and Psychiatry*, 1915, xiii., Oct.

Summary.—In summarising, let me once more call your attention to my papers on the characteristics ("Observations on the Voice in Tabes—a Voice Sign," *Amer. Journ. of Insanity*, Oct. 1915) of the voice sign in tabes, and on the voice sign ("The Voice in Tabes and the Treatment of Vocal Ataxia," *Journ. of Nerv. and Ment. Dis.*, Oct. 1915) itself as a characteristic symptom of ataxia. In the present paper I have confined myself entirely to the technique of elicitation of this voice sign. In final form the test resolves itself into this formula: Let the physician request the patient to utter the following sounds:—"e" (as in eel), "t," "journals," and "Time and tide wait for no man." AUTHOR'S ABSTRACT.

PROGRESSIVE MUSCULAR ATROPHY—CASE AND TREAT-
(235) **MENT. STUDIES IN SPEECH DISORDER, No. 2.** WALTER B. SWIFT, *Boston Med. and Surg. Journ.*, 1915, Nov. 4.

Summary.—Case of progressive muscular atrophy, with involvement of muscles of the neck to such an extent as to render some sounds impossible and others indistinct, is relieved at once, and

afterwards whenever applied, by giving the throat musculature staunch, firm support by hand, special collar or high collar applied to help out the action of those neck muscles.

AUTHOR'S ABSTRACT.

THE DEVELOPMENT OF A MENTAL DEFECTIVE BY VOCAL DRILL. STUDIES IN SPEECH DISORDER, No. 3. WALTER B. SWIFT, *Boston Med. and Surg. Journ.*, 1915, Nov 11. (236)

Summary.—Defective mentality subjected to an eight months' intensive vocal drill, with the result that a remarkable and unexpected mental development followed, showing in new initiative, wider interests, an extended observation and other minor mental manifestations. AUTHOR'S ABSTRACT.

MENINGEAL SYNDROME (IN A CHILD WITH GENERAL GLANDULAR ENLARGEMENT) OCCURRING DURING AN ATTACK OF VARICELLA. NORMAL CEREBRO-SPINAL FLUID. HEMIPARESIS OF THE PALATE. DYSPHAGIA. REFUSAL OF FOOD. GRAVE NERVOUS CONDITION; PROLONGED FEVER. GLANDULAR ENLARGEMENT. RECOVERY FROM THE GENERAL CONDITION. PERSISTENCE OF THE HEMIPARESIS OF THE PALATE. NEGATIVE CUTI-REACTIONS. (**Syndrome méningé (chez un enfant porteur d'adénopathies généralisées) survenant pendant l'invasion d'une varicelle. Intégrité du liquide céphalo-rachidien. Hémiparésie palatine, dysphagie, refus des aliments, état nerveux grave; état fébrile prolongé. Gonflements ganglionnaires. Guérison des accidents généraux. Persistence de l'hemiparésie palatine. Cuti-réactions négatives.**) GUINON and HALBRON, *Bull. Soc. de Péd. de Paris*, 1914, xvi., p. 417. (237)

THE patient was a boy, aged 4 years. The history and symptoms suggested tuberculous meningitis, but his complete recovery and negative cuti-reactions caused the writers to dismiss the idea of tuberculosis. The condition was probably due to encephalitis, which was first diffuse and finally became very localised.

J. D. ROLLESTON.

THE NERVOUS COMPLICATIONS OF TYPHUS FEVER. (**Les complications nerveuses du typhus exanthematicus.**) E. JOB and B. BALLET, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1258. (238)

THE writers observed 8 cases with nervous complications among 340 typhus patients at Casablanca. Two were examples of left hemiplegia which recovered, 1 was a fatal case of hæmorrhagic

encephalitis without paralysis, 1 had serous meningitis, 1 myelitis, and 4 peripheral neuritis, to which they were predisposed by alcoholism. In 4 cases the meninges and brain, and in 1 case the cord, were examined histologically, and showed intense congestion, especially in the vessels of the grey matter. Neither in the brain nor the cord were there definite lesions of the nerve cells. J. D. ROLLESTON.

SPASTIC PARALYSIS IN CHILDREN. With a report of seven (239) **cases.** JACOB GROSSMAN, *N.Y. Med. Journ.*, 1916, ciii., March 11, p. 495.

SEVEN cases are described. Spastic paralysis may result from an apparent normal delivery (two cases). In some cases interference with the dressing or the bathing of the infant may be the first evidence of an existing spastic paralysis (one case). In other cases delayed functions of sitting and walking direct one to the existing spastic paralysis (two cases). Convulsions in infancy, either immediately after or shortly after delivery, should make us suspicious of cerebral injury. The possibility of syphilis as the etiological factor in some cases of spastic hemiplegia must always be remembered. Where ophthalmoscopic examination reveals increased intracranial pressure, and where there is not a great amount of interference with the mentality of the patient, subtemporal decompression should be performed. In the other cases, and in the after-treatment of cases operated upon, massage, electricity, manipulation, supports, tenotomies, and muscle education usually offer relief to the patients, and influence to a certain degree the existing condition. A. NINIAN BRUCE.

A CASE OF HEMIPARESIS, ATAXIA, AND ASTEREOGNOSIS (240) **ASSOCIATED WITH ARACHNOIDAL ŒDEMA.** HANSELL CRENSHAW and CHARLES M. REMSEN, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 22, p. 262 (1 fig.).

A MAN, aged 49, a gardener with an alcoholic history, had ruptured an abscess in his left ear fifteen years ago, and since suffered from a low grade of otitis media.

Recently he became dizzy, and one day fell, striking his head, and becoming unconscious. The fall ruptured a second abscess in his left ear. He gradually recovered and returned to work, but later developed dizziness, tinnitus, marked headache, with occasional nausea and vomiting. The headache was localised to the left side of the head. The vision was impaired in both eyes, but no optic neuritis was present. There was pain from the

elbow down, and from the knee down on the right side, and the right hand showed astereognosis. Spasmodic flexor movements occurred in the right hand, and Romberg's sign was positive. No aphasia, but memory poor. Wassermann reaction negative in the blood and cerebro-spinal fluid.

Operation showed the presence of chronic leptomeningitis with arachnoid œdema and pseudo-cystic formation associated with superficial focal cerebritis, situated principally on the posterior border of the left Rolandic fissure. The fluid was released, and the wound drained for five days. The patient had returned to work three months later. A. NINIAN BRUCE.

CRANIOPHARYNGEAL DUCT TUMOURS. HARRY JACKSON, *Journ.* (241) *Amer. Med. Assoc.*, 1916, lxvi., April 8, p. 1082.

A REPORT of a case in a man, aged 18. At operation a benign cystic tumour of stratified squamous epithelium was found, originating in an inclusion of the craniopharyngeal duct. The symptoms were frontal headache and failure of vision, no adiposity, no drowsiness, and no diuresis.

Most cystic and solid tumours originating from the region of the infundibulum and anterior lobe of the hypophysis grow from embryonic rests of buccal ectoderm from the craniopharyngeal duct. They are the most common type of intracranial tumour associated with the Fröhlich syndrome. Eye changes occur early. Symptoms of acromegaly are absent. A. NINIAN BRUCE.

VENTRICULAR HÆMORRHAGE: A SYMPTOM GROUP. ALFRED (242) GORDON, *Archives of Internal Med.*, 1916, xvii., March, p. 343. (5 figs.).

FROM a diagnostic standpoint sudden onset without premonitory symptoms, profound coma at the onset and continuing for several days without improvement, absence of genuine paralysis, absence of rigidity and contracture during the days following the seizure, and absence of the toe phenomena, all speak in favour of primary ventricular hæmorrhage.

The above-mentioned phenomena were observed in five cases, in all of which the hæmorrhage occurred only in the lateral ventricles.

The next most important feature of the subject is the surgical intervention on the sound side, based on the existence of a displacement of the brain to that side. It is possible that the profound comatose state is due precisely to the sudden compression of the normal brain tissue. The amount of improvement obtained by

operation in one of the above cases was a sufficient encouragement in that direction. If a decompressive operation on the sound side is to be undertaken, it must be done promptly after the onset. In this case it was performed on the fifth day, and in spite of that delay some amelioration of the condition was decidedly manifest. It is to be presumed that the earlier relief from intracranial pressure is obtained, the more prolonged the favourable results that will be observed. A. NINIAN BRUCE.

INTRA-CRANIAL AEROCELE. E. H. SKINNER, *Journ. Amer. Med.* (243) *Assoc.*, 1916, lxvi., March 25, p. 954 (2 figs.).

A MAN sustained a fracture of the right supra-orbital ridge of the skull in a gas well explosion. He apparently recovered, and then complained of persistent headache and dizziness. A radiogram showed a round area of increased transparency in the anterior part of the cranial cavity on the right side, together with a comminuted fracture of the right frontal bone. The interpretation was that the transparent portion was due to an intradural air tumour, the air having leaked through the dura from the frontal sinus at the site of fracture. The skull was trephined over the air tumour, and the dura was found to be bulging out. It was punctured, and the gas collected under water. It proved to be air from which the oxygen had been largely absorbed by lymph.

He left hospital well in ten days, but returned ten days later with headache, high temperature, rapid pulse, vomited, and became unconscious. He died in eight days, and a leptomeningitis with much pus at the base of the brain was found.

A. NINIAN BRUCE.

THE FAMILY FORM OF PSEUDO-SCLEROSIS AND OTHER CON-
(244) **DITIONS ATTRIBUTED TO THE LENTICULAR NUCLEUS.** WILLIAM G. SPILLER, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 23.

IN this paper Spiller enumerates the various conditions attributed to disease of the lenticular nucleus as follows:—Wilson's progressive lenticular degeneration, the pseudo-sclerosis of Wesphall and Strumpell, Huntington's chorea, Parkinson's disease, spastic pseudo-bulbar paralysis with contractures and choreo-athetoid movements of Oppenheim and Vogt, and Freund and Vogt, Oppenheim's dystonia musculorum deformans and progressive athetosis. Spiller adds to the above list V. Becterew's hemitonia apoplectica, certain forms of carbon monoxide poisoning, and also a unilateral type of lenticular degeneration recently reported by Pélissier and Borel.

The views of Dejerine as being unwilling to attribute any positive symptoms to disease of this nucleus, owing to his statement that the symptom-complex of Wilson's disease has occurred without lesions of the lenticular nucleus, are commented upon.

The points of differential diagnosis between pseudo-sclerosis and Wilson's disease are discussed in detail, and then a family is reported, the members of which, the author believes, have pseudo-sclerosis :—

Case 1. An alcoholic man, 47 years, who since the age of 30 has had weakness in the lower limbs and difficulty in walking. In 1904 the upper limbs were in continual coarse tremor, and the lower limbs were spastic. No sign of Babinski, no disturbance of sensation, the liver seemed of normal size.

When examined on 13th January 1915, the forearms were held partly flexed on the arms, and the hands slightly flexed on the forearms in the position of the obstetrical hand. The tremor is a to-and-fro rapid movement from the elbow, and to some extent from the wrist. There is no atrophy, no loss of sensation, no sign of Babinski, no enlargement of liver or spleen. He has a spastic, festinant gait.

Case 2. A brother, also alcoholic, 44 years old, had had syphilis when 19 years old. He has had a tremor of the upper limbs for nineteen years, suggesting that of paralysis agitans, and not ceasing during voluntary movements; his facial expression is suggestive of the same disorder. There is no sign of Babinski and no clonus. The gait is spastic and festinant.

Case 3. A sister, aged 48, was examined by Spiller on 9th January 1915. About seven years previously the patient started to have difficulty in walking, which has steadily grown worse, and she now complains that her lower limbs feel heavy. There is no involvement of any of the cranial nerves, but the face has something of the same lack of expression seen in her brothers. The hands when extended show a fine tremor as in Graves's disease. A spastic gait, exaggerated tendon reflexes, but no sign of Babinski.

One brother, about 43 years old, is normal.

Another case is also reported with autopsy similar in some respects to the case reported by Pélissier and Borel.

D. K. HENDERSON.

THE GASTRIC MUCOSA IN DELIRIUM TREMENS. EDWIN (245) F. HIRSCH, *Archives of Int. Med.*, 1916, xvii., March, p. 354.

PETECHIAL hæmorrhages in the gastric mucosa are among the most common lesions present in the bodies of persons dying in delirium tremens.

There is no evidence of any acute inflammation about these hæmorrhages, thus leaving no anatomical basis for considering this condition in the stomach an acute alcoholic gastritis.

These hæmorrhages probably are manifestations of an acute toxæmia.

Chronic alcoholism alone is of doubtful etiologic importance in causing chronic gastritis. A. NINIAN BRUCE.

REMARKS ON *B. WELCHII* IN THE STOOLS OF PELLAGRINS.
(246) WILLIAM H. HOLMES, *Archives of Intern. Med*, 1916, **xvii.**, March, p. 453.

THE object of this paper is to call attention to the presence of abnormally large numbers of organisms belonging to the *B. Welchii* group, which have been found in the stools of pellagrins, and to inquire whether this organism may not possibly bear a causal relationship to the disease.

B. Welchii has been described by various investigators, since first described by Welch and Nuttall in 1892, as *B. ærogenes capsulatus*. Its chief point of interest is that while it is recognised as a common inhabitant of the human intestinal tract, certain dietetic errors may cause it to assume a rôle of pathologic importance.

B. Welchii was found by the author with marked regularity in the stools of pellagrins in numbers greater than normal. These pellagrins were on a dietary composed principally of vegetable foods high in carbohydrates. The diet was extremely low in protein, and especially in protein of animal origin. Diarrhœa is one of the most constant symptoms of pellagra. *B. Welchii* has been found to produce severe diarrhœa in children and adults in the presence of a high carbohydrate diet. The diarrhœa caused by *B. Welchii* can be cured by a protein diet and buttermilk. Goldberger has prevented pellagra by the addition of proteins and buttermilk to the diet, and has experimentally caused pellagra by means of a pure carbohydrate diet. Whether *B. Welchii* was present in the stools of Goldberger's cases in greatly increased numbers is not known.

The above facts by no means prove that *B. Welchii* is the direct or sole cause of pellagra, but their coincidence is sufficiently significant to justify further investigation.

A. NINIAN BRUCE.

PELLAGRA: CAUSATION AND A METHOD OF PREVENTION.

(247) **A summary of some of the recent studies of the United States Public Health Service.** JOSEPH GOLDBERGER, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 471.

THE value of diet in the prevention of pellagra was tested in two orphanages and at an asylum for the insane—endemic foci of the disease. Marked increase in the fresh animal and leguminous protein elements of the institution was made.

Of 209 cases of pellagra observed at the two orphanages, 172 completed the anniversary date of their attack under observation. In only one of these, following the change in diet, was there recognised evidence of a recurrence, although, on the basis of experience elsewhere, from 90 to 130 might reasonably have been expected. Nor was any new case observed among the non-pellagrin residents, 168 of whom completed not less than one year under observation.

Of the group of pellagrins on the modified diet at the insane asylum, 72 presented no recognisable evidence of a recurrence, although, of a group of 32 controls, 15 have had recurrences. Pellagra may thus be prevented by an appropriate diet without any alteration in the environment, hygienic or sanitary, including the water supply.

At an isolated convict camp, previously free from pellagra, with an average population of from 70 to 80 white males, 11 volunteers were segregated, and after a preliminary observation period of two and a half months, placed on an abundant but one-sided, chiefly carbohydrate (wheat, corn, rice), diet, from which fresh animal proteins and legumes were excluded. At least 6 of these volunteers developed pellagra, and this result appeared to have been brought about by the diet on which they subsisted.

The author concludes that the pellagra-producing dietary "fault" is capable of correction or prevention by including in the diet suitable proportions of the fresh animal and leguminous protein foods. A. NINIAN BRUCE.

COMPLICATED NERVE TISSUE INVOLVEMENT ARISING

(248) **FROM SYPHILIS OF THE VERTEBRÆ.** C. C. WHOLEY, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 627.

A CASE of syphilitic osteo-arthritis of the lumbar and cervical vertebræ, with vague nerve symptoms, including loss of sensation about the larynx, pharynx, and œsophagus, and in the bladder, rectum, and lower extremities. The Wassermann reaction was negative, but improvement followed anti-syphilitic treatment.

A. NINIAN BRUCE.

INTRASPINAL INJECTIONS OF MERCURIALISED SERUM IN
(249) **A CASE OF SPASTIC PARAPLEGIA.** B. M. EDLAVITCH, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 353.

A FARMER, aged 28, developed spastic paraplegia which had begun insidiously about four years previously. The Wassermann reaction was negative, and the cerebro-spinal fluid under increased pressure but clear.

He received one injection of neo-salvarsanised serum and nine of mercurialised serum intradurally, and a slow but steady improvement of the gait was noticed, and the cerebro-spinal fluid returned to normal. The gait is still spastic, but the improvement was striking. The case was considered non-syphilitic.

A. NINIAN BRUCE.

ACUTE SYPHILITIC NEPHRITIS FROM THE STANDPOINT OF
(250) **DIAGNOSIS AND SALVARSAN TREATMENT. With report of a case.** JOHN H. STOKES, *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 15, p. 1191.

SYPHILIS as a causative factor in acute nephritis is easily overlooked or its significance not appreciated. The complication may develop in the course of efficient mercurial treatment (intramuscular injections). The best recognised points in diagnosis are:—(*a*) Establishment of the existence of early syphilis, (*b*) high albumin content, (*c*) doubly refractive lipoids in the urine, (*d*) therapeutic tests. Of these *c* and *d* are probably the most reliable, and *a*, *b*, and *d* the most available. *Spirochæta pallida* should be searched for in the sediment of a catherised specimen on the recommendation of Hoffmann.

The administration of salvarsan is a valuable aid in the diagnosis and treatment of acute syphilitic nephritis. The risk in administering salvarsan in proper doses to a nephritic suspected of being syphilitic, to establish a diagnosis, is no greater and perhaps less than that incurred by using a sufficient dose of mercury. The effect of salvarsan is much more prompt, but in small doses less lasting than that of mercury in average doses. The general therapeutic response is probably better with salvarsan than with mercury. Renal injury from salvarsan seems to be the result of overdosage, either in the form of too large or too frequent injections. The place for mercury would seem to be after the disappearance of the albumin to secure permanent results. Small doses of salvarsan, from 0·15 to 0·2 gm., or its equivalent, at weekly intervals, are adequate, and must not be exceeded at the onset, but may be cautiously increased to 0·4 gm. later.

A. NINIAN BRUCE.

DRAINAGE OF CEREBRO-SPINAL FLUID AS A FACTOR IN
(251) **THE TREATMENT OF NERVOUS SYPHILIS.** SHERMAN F. GILPIN and THOMAS B. EARLEY, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 22, p. 261.

THE authors discuss the question why, if arsenic or mercury are present in the blood and produce good results in all other forms of syphilis, no such results are obtained in syphilis of the nerve tissues? Is it because the choroid plexus will not allow such substances to pass, or is it because, if they do pass into the cerebro-spinal fluid, it must be by osmosis and this does not take place because the pressure of the fluid equals the pressure of the blood in the venous sinuses and capillaries? If the latter is the case, why not saturate the patient's blood with either salvarsan or mercury, and at intervals drain off the cerebro-spinal fluid by lumbar puncture, lower the pressure in the cerebro-spinal sac, and thus cause the drugs to osmose through the capillaries?

In following out this suggestion, the authors tried to drain their patients once a week. As much cerebro-spinal fluid as would flow was drained off (from 20 c.c. to 40 c.c.). Three cases are recorded. Some improvement resulted, but it is admitted that it does not necessarily follow it was due to the above treatment.

A. NINIAN BRUCE.

ON EARLY MENOPAUSE IN VIRGINS. (**Da menopausa precoce**
(252) **nas virgens.**) A. FARANI, *Arch. Bras. de med.*, 1915, v., p. 287.

A RECORD of two cases. In the first the menopause developed at the age of 33, and was accompanied by symptoms of ovarian insufficiency and melancholia. In the second it occurred at 32, and was followed by symptoms of ovarian insufficiency and Graves's disease. Farani attributes this early menopause to the absence of the female orgasm, as he has met with other cases in which marriage has remedied the condition. The intense pelvic hyperæmia occurring during the orgasm helps in normal functioning of the ovary and uterus. J. D. ROLLESTON.

SOME ATTEMPTS TO PRODUCE EXOPHTHALMOS EXPERI-
(253) **MENTALLY.** ABRAHAM TROELL, *Archives Int. Med.*, 1916, xvii., March, p. 382.

THE author here records a number of experiments in which he attempted to produce exophthalmos experimentally without the mediation of the cervical sympathetic. The method consisted in the subcutaneous injection of paraphenylenediamin (0·075 gm. per kilogram body weight). He found that the eye symptoms produced, which usually include protrusio bulborum, may be

brought about without the intervention of the cervical sympathetic. These changes seem to be due largely to disturbances of the circulation. "There is much to be said against the assumption that exophthalmos in exophthalmic goitre may be the result of a sympathetic stimulation." A. NINIAN BRUCE.

BLOOD FINDINGS IN EPILEPSY. RALPH H. SPANGLER, *Lancet*, (254) 1916, April 29, p. 910.

THE percentage of hæmoglobin in epilepsy is comparatively high (84 per cent. in the present series of 100 cases). The red cells show no marked diminution and, with few exceptions, no evidence of degeneration in cases of uncomplicated epilepsy. The white cells in cases of epilepsy fall within the normal limits during the interparoxysmal periods; uniformly, however, there is a tendency to leucocytosis, and at times a hyperleucocytosis at the time of, and frequently for twenty-four hours following, an epileptic seizure. The average percentage of the small lymphocytes and the polymorphonuclear cells in the 100 cases examined fell within normal limits; the large lymphocytes averaged 9 per cent. above the normal range, and there was no evidence of eosinophilia.

The clotting time of the blood is shortened before an epileptic seizure. The range of the clotting time of the blood in 98 of the cases of epilepsy in this series was shorter during interparoxysmal periods (1·5 to 4·75 minutes) than it is in normal individuals (3 to 8 minutes is given by most investigators).

The alkalinity of the blood is lower in cases of epilepsy than in control individuals on the same diet. A. NINIAN BRUCE.

DIAGNOSTIC METHODS AND PATHOLOGIC CONSTANTS IN IDIOPATHIC EPILEPSY. CHARLES A. L. REED, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 336 (13 figs.).

(255)

THE author comes to the following conclusions:—

Idiopathic or essential epilepsy is an infection.

The infecting organism, the epilepticoccus, has the same relative importance to epilepsy that their respective etiologic organisms have to malaria, tuberculosis, tetanus, or typhoid. Whatever may be its primary habitat, it finds its way under circumstances of forced absorption from the alimentary canal into the blood.

The conditions that enforce absorption from the alimentary canal consist in mechanical distortions, with resulting constipation in the form of either obvious or masked stasis.

These conditions point to a logical line of treatment as follows:

(*a*) The organism should be isolated in each case with reference to the development of an antigen and the possible immunisation of the patient; (*b*) in the absence of such immunisation, and in otherwise favourable cases, the mechanical conditions of the intestines responsible for the enforced absorption should be surgically corrected, and a stop put to the further intake of the organisms by restoring the normal drainage of the bowel; (*c*) post-operative treatment should be instituted to neutralise and eliminate the residual infection already established in the glands and blood of the patient; (*d*) the intercurrent chronic acidosis, which exists, without exception, in these cases should be reversed before surgical interference. Failure to observe this precaution may result in a high surgical mortality. A. NINIAN BRUCE.

DRUG ADDICTION. Analysis of one hundred and forty-seven cases
(256) **at the Philadelphia General Hospital.** JOSEPH M'IVER and GEORGE E. PRICE, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 476.

IN studying the comparative value of treatments, patients were treated as follows:—

1. The original Lambert method.
2. Lambert's method without the Belladonna R.
3. Lambert's method without free purgation.
4. Gradual withdrawal.
5. Gradual withdrawal with free purgation.

The method employed was to select several patients for comparison, of approximately the same age, the same daily dose of the drug or drugs in combination, and of the same duration.

The conclusions were as follows:—

1. The original Lambert treatment was more satisfactory than the ordinary gradual withdrawal.

2. The Lambert method without free purgation (using ordinary purgation) was very unsatisfactory, patients suffering intensely, and showing a marked tendency to delirium.

3. The Belladonna R. was the least important element in the Lambert treatment, having little or no greater value than other sedatives, besides having a tendency in certain cases to produce delirium.

4. Having a fixed dosage for each patient, as in Lambert's treatment, is an undesirable feature, which does not allow for individual differences; to disturb a patient every hour of the day and night is folly; and to try to blend him to a machine treatment is a very unwise procedure.

5. The best method proved to be gradual withdrawal with free purgation as in the Lambert treatment, and sedatives or stimulants as required in the individual case.

Patients using daily very large doses of drugs, and over long periods of time, can only have the drug withdrawn very gradually, without intense suffering or danger of collapse. The majority of narcotic drug habitués are not also addicted to the excessive use of alcohol. A. NINIAN BRUCE.

DISCUSSION ON NYSTAGMUS. *Proc. Roy. Soc. Med.*, 1914, vii., April (257) (Sect. of Neurol., Ophthalmol. and Otol.), pp. i.-lxxxiv.

THE report of the discussion on nystagmus in the Royal Society of Medicine occupies 84 pages, and deals with the proceedings of three combined meetings of the sections of Neurology, Ophthalmology, and Otology. Numerous cases were shown, and a number of very interesting papers were read, treating of the subject from all points of view. The ground covered is so extensive, and the wealth of detail so great, that it would be impossible to do justice to the report as a whole even in a lengthy abstract. Those who are interested in the numerous forms and varieties of nystagmus will find in the original a full exposition of our present knowledge of the subject. H. M. TRAQUAIR.

NYSTAGMUS AND ALLIED CONDITIONS. J. A. WILSON, *Lancet*, (258) 1915, Oct. 23, p. 913.

IN the first part of this paper details are given with regard to 200 cases of nystagmus. The figures show that males and females are equally affected, and the young more than the old. Bad vision was present in 88 per cent., and only 7 per cent. were known to be emmetropic, while hypermetropia and myopia were about equally present in 75 per cent. Apart from refractive errors, 60 per cent. of the eyes had some form of disease or abnormality. The great majority of the cases began before 5 years of age, and most of these between 3 months and 5 years. The movements observed were—lateral, 61 per cent.; rotary, 16 per cent.; oblique or irregular, 13 per cent.; vertical, 6 per cent.; lateral and rotary, 4 per cent. Associated conditions were head-shaking, spasm of eyelids, and contraction of the field of vision. Occupations included school children, 68; housewives, 31; general workers, 38; clerks 3; miners, 24; no occupation, 8; infants, 28. Thus nearly half were at or below school age.

Wilson believes that nystagmus is caused by any condition which produces bad retinal images. Thus he regards "miners'

nystagmus" rather as "nystagmus occurring in a miner" than as an entity in itself. Certain occupations involving near work, such as type-setting, may also cause nystagmus, so that the form occurring in miners is not the only occupational nystagmus. A few cases were found to be hereditary, but did not conform to Mendelian laws. Some cases of abnormal movements of the orbital muscles allied to nystagmus are discussed, such as "jaw winking," rhythmic closure of the eyelids, and cyclic affections of the third nerve, conditions which are attributed to want of cortical control. The author's theory is that the absence of clear retinal images leaves the visual centre imperfectly supplied with impressions, thus producing a condition of cortical abeyance or imperfect control with unregulated overaction of the lower centres. Suggestions as to treatment complete a paper which contains many points of interest. The low percentage (12 per cent.) of miners' nystagmus in a Glasgow clinic is very surprising, and many ophthalmologists will not agree with the author's attitude towards this disease. H. M. TRAQUAIR.

PARALYSIS OF THE RECURRENT LARYNGEAL NERVE RESULTING FROM MITRAL STENOSIS. JOSEPH ROSENTHAL, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 333.

(259)

RADIAL PULSE DIFFERENCE AND LEFT RECURRENT NERVE PARALYSIS DUE TO MITRAL STENOSIS. JOHN GUTTMAN and SELIAN NEUHOF, *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 335.

(260)

THE various theories held accountable for this paralysis are:—

1. Ortner's theory that the paralysis is due to pressure of the enlarged left auricle on the recurrent nerve.

2. Kraus's theory that the right ventricular dilatation present in mitral stenosis causes displacement of the heart to the right, with consequent dragging on the aortic ligament and arch, and resultant stretching and paralysis of the nerve.

3. Alexander's theory that the pulmonary artery, by its own enlargement, or indirectly by enlargement of the left auricle, is pressed against the nerve and aortic arch.

4. The nerve may be compressed and caught between bands of pericardial and mediastinal adhesions.

Only eleven cases of this condition appear to have been confirmed by necropsy.

The first paper records two cases, neither confirmed by autopsy. The second records a case in a woman, aged 25, showing, in addition, a marked difference in the two brachial blood pressures, and in the radial pulses. This was considered to be due to the dilated pulmonary artery being wedged in under the aortic arch opposite the origin of the left subclavian artery. A. NINIAN BRUCE.

PSYCHIATRY.

CRITICAL HISTORICAL REVIEW—REIL'S RHAPSODIEEN.

(261) WILLIAM A. WHITE, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 1.

THIS work of Reil's, published in 1803, is an attempt to formulate the principles of psycho-therapy, and owing to the present-day interest in regard to the relation of psychology, psychotherapy, and psychiatry to internal medicine it has been thought well to carefully review it.

As a sort of preface, a short account is given of Reil's life. Attention is drawn to his work on fevers and brain anatomy, and it is supposed that his interest in mental states was derived from studying the mental phenomena in fever patients, and also from his great interest in brain anatomy. Reil was not only a keen observer of abnormal mental states, but examples are also given, in his psychological discussions, of how he was extremely interested in the psycho-pathology of everyday life, in the significance of hypnogogic and dream states, and in the correlation and integration of the individual. "In these psychological discussions he speaks frequently of the polarity of the organism, and uses such expressions as the plus and minus irritability between the antagonistic systems, and says in one place that it is the inversion of the plus and minus vitality in the antagonistic systems that produces insanity." Dr White examines the above theory in relation to the work of Eppinger and Hess on the autonomic system, and also in connection with Bleuler's principles of ambivalency and ambitendency. In regard to treatment, Reil takes the position that mental disease must be treated both through the body and through the mind, but "he who wishes to be a physician to the soul must be familiar with both. Woe to the patient if the physician tries to treat his psychic pain with hellebore or his difficulty of thinking by trying to thin the atrabiliary blood, and dissolve a coagulum in the portal vein." He discusses the various psychic means that may be employed in treatment, and gives many naïve examples of their application. Great stress is laid on commanding obedience and attention, even although it may be necessary to resort to measures that terrify, and the reviewer particularly refers to the work of Adolf Meyer on the treatment of paranoiac conditions, where the principles involved in the above methods are discussed.

In addition to the above, Reil discusses the value of work as a therapeutic agent, and the principles of construction and administration of an asylum.

There is so much of interest in this work of Reil's that those interested would do well to read Dr White's review in full.

D. K. HENDERSON.

CATATONIC STATE IN MANIC DEPRESSIVE INSANITY.
(262) JOSEPH SMITH, *N.Y. Med. Record*, 1915, Feb. 20, p. 311.

SUMMARY.—One case. Both manic and depressed phases contained catatonic phenomena of like form. WALTER B. SWIFT.

PROGRAMME AND DIRECTIONS FOR THE MENTAL EXAMINA-
(263) **TION OF ASOCIAL, PSYCHOPATHIC, AND DOUBTFUL SUBJECTS.** ROSE S. HARDWICK, *Boston Med. and Surg. Journ.*, 1915, June 3, 10, 17, and 24.

1. A REVIEW and comparison of the Binet-Simon age scale and the Yerkes-Bridges point scale for measuring intelligence. The minute detail does not lend this article readily to summary. Six references.

2. The Healy tests are summarised. Review of the Knox scale from Ellis Island for aliens. Preliminary to mental examination, put subject at his ease. Familiar surroundings help, and distressing ones cause apprehension. Easing questions, presence of parent or friend, closing the door himself, may set a subject at his best. Reliable eye and ear examinations should precede the psychological examinations.

3. Compares intelligence scales. Summary: with illiterates use the Knox scale. Programme of tests are arranged under four heads: precautionary cases, mental cases, social cases, suspected psychoses, illiterates, non-English speaking subjects. These are explained in some detail. Gives two illustrating examinations of mentality.

4. Here tests are classified by functions. Ends in advice for effectivity examination. Article too detailed for summarisation. As a whole, the three papers give a good comparative critique of modern mental test methods. Can be understood only by the psychological expert on mental tests. No medical, neurological, or psychiatric side presented. Twelve references.

WALTER B. SWIFT.

PSYCHOPATHIC HOSPITALS AND PROPHYLAXIS. FRANKWOOD
(264) E. WILLIAMS, *Boston Med. and Surg. Journ.*, 1915, June 24.

WILLIAMS posits four prophylactic classes: (1) The same to become insane from some external agent; (2) the same to become insane

under certain specific conditions; (3) the present insane; (4) the recovered insane. The first two groups make the special field of prophylaxis. Massachusetts adds three thousand insane yearly. Prophylaxis should endeavour to prevent these by curing syphilis at onset, by separating the feeble-minded before conception, by warning the neurotic before the breakdown. Our modern laws favour these, but are not used in some places. For this the Psychopathic Hospital is valuable. No references.

WALTER B. SWIFT.

VARIATIONS IN THE SENSORY THRESHOLD FOR FARADIC
(265) **STIMULATION IN PSYCHOPATHIC SUBJECTS.** G. PHILIP GRABFIELD, *Boston Med. and Surg. Journ.*, 1915, Aug. 5, pp. 198-202.

SUMMARY.—Twenty-five cases selected at random confirm the first series of findings. Method devised by Martin for measuring induction shocks. Depressed phase of manic shows use of threshold. This falls to normal with return of normal emotional state. Manic phase shows a normal or slightly lowered threshold. Thresholds go higher with hallucinations. The series shows these changes are of central origin. The manic depressive syndrome may be due to thalamic functional perversion. (Thirteen references.)

WALTER B. SWIFT.

A PROGRAMME OF PSYCHIATRIC PROGRESS. A. J. ROSANOFF,
(266) *N. Y. Med. Record*, 1915, Feb. 20, pp. 299-302.

PROGRESS in psychiatry has always been behind that of general medicine; progress largely dependent on legislation. The law may declare insane people to be incompetent, irresponsible, of limited testimonial capacity, or committable. As this term is vague, author proposes to substitute "mental disorder." Mental disorder ranks one as a potential criminal. Prevention is here needed. This mostly hereditary. (Five references.)

WALTER B. SWIFT.

A RESEARCH ON THE PROPORTION OF MENTAL DEFECTIVES
(267) **AMONG DELINQUENTS.** AUGUSTA F. BRONNER, *Journ. Crim. Law and Criminol.*, 1914, Nov., p. 561.

ALL studies of offenders are based necessarily on a selected group. Studies made in institutions deal with a highly selected group. All such studies are necessarily unfair representations of the whole body of offenders. Studies made in courts just prior to or immediately following trials are subject to grave errors, due to the attitude of the examiner, examinee, or both. External factors

which act as handicaps to the examinee are sometimes involved. The use of inadequate tests and errors in procedure invalidate the results given in numerous studies previously published.

On the basis of a study of more than 500 cases in a group as little selected as is possible to obtain, the author found the percentage of feeble-minded to be less than 10 per cent., while the group of those normal in ability exceeds 90 per cent.

A. NINIAN BRUCE.

Reviews

PATHOLOGICAL LYING, ACCUSATION, AND SWINDLING: A
(268) **Study in forensic psychology.** Criminal Science Monograph. No. 1. WILLIAM HEALY and MARY TENNEY HEALY. Pp. xii+286. Wm. Heinemann, London. Pr. 10s. 6d. net.

CAREFUL studies of offenders make group-types stand out with distinctness. Very little advancement in the treatment of delinquents or criminals can be expected if typical characteristics and their bearings are not understood. The whole study of characterology or the motivation of conduct is extremely new and there are many indications of immense values in uncovered fields. The group with which this monograph is concerned is comparatively little known, although cases belonging to it, when met, attract much attention.

Pathological lying is falsification entirely disproportionate to any discernible end in view, engaged in by a person who, at the time of observation, cannot definitely be declared insane, feeble-minded, or epileptic. Such lying rarely, if ever, centres about a single event; it represents a trait rather than an episode. Extensive, very complicated fabrications may be evolved. This has led to the synonyms:—mythomania, pseudologia phantastica. The pathological liar forms a species by himself and cases of epilepsy, insanity, and mental defect engaged in pathological lying should not be included under this heading.

Pathological accusation is false accusation indulged in apart from any obvious purpose. The most striking form of this type of conduct is, of course, self-accusation.

The inclusion of swindling is due to the natural evolution of this type of conduct from pathological lying. Swindling is hardly a pathological phenomenon, as it is entered into for reasons of tangible gain, but when it is the products of the traits shown

by a pathological liar it, just as the lying itself, is a part of the pathological picture.

Notwithstanding the grave and sensational social issues arising from pathological lying, accusation, and swindling, it is only slightly understood, and curiously almost nothing has been written upon it in English. The only method by which good understanding may be obtained of the types of personality and mentality involved is by the detailed study of typical case histories. In this fact is found the reason for the presentation of this monograph.

After the introduction there follows a chapter upon previous studies on the subject. Pathological lying was first definitely brought into notice by Delbrück in 1891, who based his observations on five cases which are here briefly summarised. Most of the subsequent work was also German with some French observations, all recorded here, but very few represented pure types of the condition.

Case histories are next given of twelve cases of pathological lying. These are worked out with great care at considerable length and are most instructive. Then follow nine cases of pathological accusation, comprising both self-accusation and incrimination of others, similarly described in great detail. Lastly, there are given histories of six cases of pathological lying in border-line mental types. This chapter does not include the out-and-out insane, nor the feeble-minded or epileptic, although it must be remembered that the really insane may also lie pathologically. Many of the cases here included are difficult to classify.

Out of nineteen mentally normal cases only three or four did not come from stock showing striking defects. Although unfortunate conditions or experiences were often causal factors, the total findings seem to show clearly that these latter influences generally bore their unfortunate fruition upon inherited instability. There is absolutely no proof that pathological lying may be inherited. Only one of these nineteen cases was a male. Prognosis and treatment are uncertain. Every effort must be made towards specifically stabilising the pathological liar in the matter of truth-telling by checking the springs of misconduct and by diverting energies and talents into their most suitable channels. The problem must ever be one for individual therapy. The results of the authors are most hopeful.

Dr Healy has here added to the reputation he established for himself on the publication of "The Individual Delinquent" (*v. Review*, 1915, xiii., p. 614), as one of the foremost workers on this subject.

THE PATHOLOGY AND TREATMENT OF THE SO-CALLED NERVOUS ASTHMA. J. B. BERKART, M.D. Pp. 54. Humphrey Milford, Oxford University Press, London. 1916. Pr. 2s. 6d. net.

(269)

THE author here calls attention to the fact that under the names of bronchial, spasmodic, and nervous asthma, two distinct forms of paroxysmal dyspnœa are confused: one in which the disturbance of respiration is due to transient obstacle in the bronchial tube, the other in which the air-passages are perfectly pervious, allowing a free ingress and egress of air to and from the lungs. The first type may be called bronchial asthma, and is due to the presence of a very tenacious sero-fibrinous exudation. The second may be described as nervous asthma and is accompanied by no mechanical obstacle in the air-passages. Both these conditions are considered to be the consequence of rickets, which in the first type has crippled the thorax, arrested the full development of the lungs, and impaired their nutrition, but in the second type has chiefly affected the spine, only slightly the chest and lungs, and led to deformities of the vertebral column.

This so-called nervous asthma develops upon an endogenous neuropathic basis. It occurs in individuals with a reduced resistance to all irritations, whether peripheral or visceral, and with it an increased tendency to reflexes. There is also a marked hypersensitiveness to all kinds of stimuli, the effects of which are in the healthy hardly, or not at all, perceived, but which are here attended by the most distressing sensations. Occasionally there is a history of epileptiform seizures, which are said to alternate with the asthma. Many of them are anxiety neuroses, the contents of which, whatever may be their cause, are the fear of an impending dyspnœa. "Cat asthma" occurs in persons who have become acquainted with the fact that an immediate contact with an unhealthy cat may convey an infection with ringworm, and that stroking it may leave hairs sticking to the hand, which, when applied later to the eyes or nose, may produce symptoms similar to hay fever. It is not due to animal emanations. Hyperasthesia and hyperalgesia of the gastro-intestinal tract, flatulence, &c., may all transmit their disturbing effect to the respiration and circulation.

The successful treatment of this affection depends upon an accurate diagnosis. It is of particular importance that the patients be removed from an atmosphere of asthma. Their full confidence must be obtained. While no effort should be spared to induce them to give up their constant recourse to noxious drugs, it must always be remembered that their nervous system is too strained to brook any criticism of their habits. Change of air is usually advisable, and the nutrition must be carefully attended to.

Many other useful suggestions are given here, and it is to be noted that the author distinctly deprecates the value of nasal operations, except where the nasal passages are so blocked as to allow secretion to accumulate behind the obstacle and thus be sucked into the air-passages. Apart from this "the alleged benefit is due to suggestion."

The author's views are quite clearly expressed and seem to justify his contention that so-called nervous asthma must be recognised to be a distinct clinical entity.

FIBROSITIS (gouty, infective, traumatic), so-called chronic rheumatism, including villous synovitis of knee and hip, and sacro-iliac relaxation. LL. JONES LLEWELLYN and A. BASSETT JONES. Pp. xxxv+693, with 6 coloured plates and 136 figs. 1915. William Heinemann, London. Pr. 25s. net.

(270)

ALTHOUGH the subject of chronic rheumatism has from time immemorial engaged the attention of thoughtful physicians, there is perhaps no disorder concerning the nature of which speculation has been so rife, and the treatment of which has for so long been conducted on frankly empirical lines. Until quite recently all views of its anatomical basis were purely speculative, and in consequence its various clinical manifestations were not understood. Latterly, however, the anatomical substratum of the disease began to be ascertained, and the designation of this order by the term "fibrositis" is, indeed, a tribute to our more exact knowledge regarding the morbid anatomy of chronic rheumatism.

The authors first define those clinical entities which they include under this heading. They then propose three main divisions—(1) infective or toxic fibrositis, (2) traumatic varieties of fibrositis, and (3) static disorders falsely yclept "rheumatic."

The infective or toxic type may be divided into three groups—articular, muscular, and neuralgic. These three types are all considered to be the result of infection by organisms of attenuated virulence. The chief exciting causes are "chill," sore throat, and alimentary disorders, while insufficient or excessive muscular exercise is often responsible for variations in the muscular type. The pathology, clinical symptoms, diagnosis, differential diagnosis, and prognosis are all then discussed in considerable detail, and the whole question of treatment is thoroughly considered.

Traumatic fibrositis is dealt with from the points of view of strain and rupture of muscles in the trunk and limbs. A chapter is devoted to traumatic lumbago, in which such a diversity of lesions may be encountered, and another discusses the question of the detection of fraud. Acute rheumatic synovitis, bursitis,

and other similar conditions associated with trauma are also considered.

Separate chapters are devoted to villous synovitis of the knee and hip, and special stress has been laid on the possibility that such villous changes constitute the preosteophytic stage of osteo-arthritis in these articulations.

Pending the identification of the causal organism or organisms of acute muscular rheumatism, the authors think that some specific connection between them and the various types of chronic rheumatism or fibrositis will yet be found. Fibrositis is a general reaction to many organisms; it may occur in gonococcal, influenzal, syphilitic, and many other infections. In producing this monumental book the authors have clearly done excellent work. It represents an enormous amount of labour, and is based on a very wide clinical experience. It is extensively illustrated. Everything possible to make the descriptions clear and simple has been done. The association of gout with rheumatic affections is specially brought out, and the photographs and coloured plates illustrating the various manifestations this combination may show are among the best we know. The whole question of treatment is exhaustively dealt with. The association of the clinical symptoms of chronic rheumatism with fibrositic changes in the tissues, and the importance of the latter, is brought prominently forward here, and is deserving of careful study. Unfortunately there is no bibliography, and references are not given to the numerous papers quoted.

(271) **BACK INJURIES and their significance under the Workmen's Compensation and other Acts.** ARCHIBALD MCKENDRICK. Pp. viii + 173, with 14 figs. E. & S. Livingstone, Edinburgh. 1916. Pr. 2s. 6d. net.

"BACK injuries have a bad reputation. The workman looks upon them with apprehension, the insurance company with doubt, the medical examiner with suspicion, the lawyer with uncertainty, and the Court with as open a mind as is possible under the circumstances."

That back injuries frequently present exceedingly puzzling problems for diagnosis is only too well known even to those whose experience is slight. We have, however, no hesitation in stating that a perusal of this book will simplify and remove most of the difficulties ordinarily met with.

It commences with a description of the anatomy of the spine, muscles, and fasciæ of the back. This is followed by some remarks upon muscular tissue in general, strain, rupture (rare), contusion and healing of muscle, and surface anatomy of the back. The

actual examination is next considered. Strained or "racked" back is the commonest form of injury. The history must be attended to in detail, the man should be asked to put himself in the exact attitude he was in at the time of the accident. This will cause pain and afford valuable information. The complaint at the time of examination must be carefully noted, and is often of value. Pain should be considered under the heading of local and referred pain. Stiffness, weakness, deformity, disappearance or exaggeration of normal curves and measurements of the range of movement must all be attended to. The X-ray examination plays an important part, and the author emphasises the fact that one must "beware of the fifth lumbar vertebra." The body of this vertebra is far removed from the X-ray plate, it is wedge-shaped, and lies at such an angle that the X-rays fall obliquely on it, and the shadow cast upon the plate is ill-defined. Damage is often diagnosed here where none exists. To avoid this mistake the three following points must be considered:—(1) Could the violence possibly have produced a fracture in this particularly strong region? (2) Do the symptoms point to gross damage to the base of the spinal pedestal? (3) Is the diagnosis of damage justifiable from X-ray examination alone? Further sections deal with electrical testing by the condenser method and with the physics of back injuries, several physiological disabilities to which the back is liable, and which markedly predispose to strain, being pointed out.

We have no hesitation in recommending this book. It deals with the common and everyday cases, and supplies concisely and satisfactorily exactly the information required.

BOOKS AND PAMPHLETS RECEIVED.

Ash, Edwin L. "Stammering and Successful Control in Speech and Action." Mills & Boon, Ltd., London. Pr. 2s. 6d. net.

Bronner, Augusta F. "Effect of Adolescent Instability on Conduct" (*Psychol. Clinic*, 1915, viii., No. 9).

Bronner, Augusta F. "Research on the Proportion of Mental Defectives among Delinquents" (*Journ. Crim. Law and Criminol.*, 1914, Nov.).

Bruce, H. Addington. "Sleep and Sleeplessness." Mind and Health Series. Wm. Heinemann, London. Pr. 5s. net.

Burr, Charles W. "Text-book of Nervous Diseases" (Curschmann). Authorised English translation. Vols. I. and II. P. Blakiston's Son & Co., Philadelphia. Pr. $12.00 net.

Carlill, Hildred. "The Diagnostic Importance of the Ankle-jerk" (*Journ. Royal Nav. Med. Serv.*, 1916, ii., April, pp. 180-187).

Coriat, Isador H. "The Meaning of Dreams." Mind and Health Series. Wm. Heinemann, London. Pr. 5s. net.

Review

of

Neurology and Psychiatry

Original Articles

THE TREATMENT OF FUNCTIONAL BLINDNESS AND FUNCTIONAL LOSS OF VOICE.

By A. NINIAN BRUCE,
Temp. Captain, R.A.M.C.

THE following two cases of functional blindness and functional loss of voice were admitted to the Neurological Wards of the Royal Victoria Hospital, Edinburgh, a few months ago, after all attempts at cure had proved unsuccessful.

Case I.—Functional Blindness in One Eye Cured by Injections of Normal Saline into the Temple.

A soldier was admitted to the above hospital with the following history: After training he had been sent to the Gallipoli peninsula, landing there on 1st May 1915. He had remained well until 12th August, when a shell exploded near the trench he was occupying. The trench was blown in, and he was buried in the earth. He was immediately dug out, and found he had received no visible injury of any kind, but was very nervous, tremulous, and thoroughly shaken. Shortly afterwards a second shell burst very close to him. He remembers a bright flash, and nothing more until he found himself in hospital. He then found his sight had become very poor, and that he could not see at all with his left eye. His hearing was unaffected, and his speech remained normal. He could not remember on which side the

shell had burst. He was brought home, and reached the above hospital on 9th October, having thus been continuously blind in his left eye for two months.

He was a highly nervous, easily excitable man. His memory was good, and he was somewhat depressed about himself. He said he was quite well, except that his left eye was quite blind, and that he had pain in this eye, and headache. The sight in the other eye was not so good as previously, but the difference was not very great. The left eye showed marked drooping of the eyelid, the pupil reacted to light and to accommodation, there was no nystagmus, and movement was free in all directions. He said he had not been able to distinguish light from darkness in this eye since he lost the sight of it on 12th August, and that no improvement of any kind had taken place in spite of many different kinds of treatment. He had never been given any anæsthetic. The fundus appeared normal. He was keenly anxious to get better. No areas of loss of sensation were found anywhere.

It was carefully explained to him that the eye itself had not been injured in any way. He said he thought it had not, but could not understand how he was blind in it if this were correct. He had not seen any of his friends affected this way at any time. After he had himself fully realised that no injury to the eye had occurred, he was told that the reason he could not see with this eye was because it had become so weak as the result of the explosion, and that he was going to be given a series of injections into his left temple of a very strong drug, which would so strengthen his eye that the sight would be restored. He was accordingly given daily injections every morning into the left temple of gradually increasing quantities of normal saline solution. After four days he said he felt the treatment was doing him good, and was going to cure him, although no improvement in the sight of this eye could be discovered. A week later he said he was sure the eye was much stronger. On the evening following the fifteenth injection he said he could not get to sleep. His headache was much worse, and seemed to be "moving about inside his head." He was very restless, and had to get out of bed repeatedly and walk about the ward. Towards the early morning he finally went to sleep, and it was reported by the other patients that he had been very restless. About eight o'clock he awoke suddenly to find his left eye had recovered its sight, and that he

could see perfectly well with it. He was extremely excited over the recovery, talked of nothing else, told every one he met about it, and seemed overjoyed at the result. Closer examination showed that the sight was blurred at times, and four days later he said he felt he was becoming blind again. He was immediately given a large injection of normal saline into the temple, which caused much pain at the time. Since then no relapse again occurred, and he was later sent back to his unit at his own request. The sight in the other eye also improved at the same time.

Case II.—Functional Deafness Cured by Light Etherisation.

A soldier was admitted to hospital complaining of complete deafness in his left ear. While in France he had been under shell fire a number of times, and was finally thrown down and rendered unconscious by a shell explosion close to him. He remembers nothing until he found himself in hospital. The shell exploded on his left side, but he has no recollection of the noise of the explosion. The hearing in the right ear appeared to be unaffected, but ever since this explosion he had begun to stutter, and this had been getting rather worse. He never lost his speech.

Careful examination of the ear showed that the deafness was purely functional. He was accordingly given ether inhalation, and when just under he was asked if he could hear anything spoken into his right ear. He said "Yes." The right ear was then closed, and he was asked if he could hear when his left ear was spoken into. He said "No." This was repeated several times. Whenever he was addressed on his right side he said he heard well, but when addressed on his left side he said he could not hear at all. His right ear was then covered and he gave his name, regiment, &c., in reply to questions whispered into his left, that is, his previously deaf ear. It was then pointed out to him that he was answering questions spoken into his left ear, and that his right ear was closed. On realising this he was suddenly wakened up. When he found he could hear properly with his left ear he was overjoyed, laughed hysterically, then cried, then shook hands with everybody repeatedly, and went back to the ward, telling every one he was cured.

He was perfectly well all day, had a good night, and next

morning was again stone deaf in his left ear. No one could get him to understand a word spoken into this ear. It was blistered and electricity was applied, but no benefit of any kind resulted, although it was noted that the fact that the hearing had returned for a whole day had a marked influence upon him, as he was now completely puzzled about himself. The only point he was certain of was that he was again deaf in his left ear.

A fortnight later he was again given ether. As he took a long time to go under, a little chloroform was added, and he was soon semiconscious. Again he answered "Yes" when asked if he could hear with his right ear, and "No" when asked if he could hear with his left ear. It was then explained to him he could hear well with both, and that he could answer questions whispered into his left ear when his right ear was closed. He was then allowed to gradually recover from the chloroform, but by the time he had come out he had lost any recollection of what had happened to him, and his left ear was as deaf as before. Ether was again given, and he was asked to close his right ear with his finger. When answering questions addressed to his left ear, he was then suddenly wakened, and immediately said his hearing had come back. He did not this time show the same outburst of joy, although very pleased, and the return now proved permanent. He later returned to his depôt. It was also interesting to note that in all his conversations while under ether, no stutter was present. He had been totally deaf in his left ear for about five months.

The administration of ether for the cure of functional deafness and functional loss of voice has always in our hands proved satisfactory. It is essential that the loss of consciousness be slight, and that the patient be suddenly roused so as to realise that he is speaking or hearing. The moment he becomes conscious of this, an instant change seems to take place, and his joy usually is very visibly shown. Chloroform anæsthesia is not satisfactory, as the recovery from the anæsthetic is too slow, and does not allow the patient to realise himself that he has been speaking or hearing when he previously was dumb or deaf. It is very important that this treatment be not used by those without experience, as failure causes the patient to lose confidence in the method, and once confidence is lost recovery by this means is rendered more difficult.

Abstracts

BRAIN, SKULL, &c.

RADIOGRAPHY IN GUNSHOT WOUNDS OF THE SKULL.

(272) GEORGE VILVANDRÉ, *Arch. Radiol. and Electrother.*, 1916, xx., Feb., p. 306 (5 figs.).

THE undertaking of the operation of trephining should not be lightly done, and within reach of an X-ray apparatus and competent radiographer no operation should take place on a skull which has not been previously radiographed to ascertain the presence or absence of a foreign body and its careful localisation. Symptoms of compression may be relieved by lumbar puncture, and a radiogram, by showing the presence of a foreign body, will prevent the necessity of a second operation. A bullet or shrapnel left in the brain will usually cause death in six months from cerebral abscess.

It must be remembered that even a good radiogram may be negative when the clinical symptoms point to the presence of a depressed fracture, which may be small or at the base. This apparent failure of the X-rays is still more obvious in the presence of a small linear crack or fissure, although this may often also be shown. Furthermore, the damage to the skull is, as a rule, more extensive than shown on the radiograph, probably due to the incidence of the rays on a round body. Two plates are usually required for localisation, one lateral and one antero-posterior.

The writer is also impressed by the fact that skulls with long comminuted fractures and no foreign body, and in which even depression was great, seemed to do well. He suggests that long fractures are more efficient in relieving pressure than localised small trephining of one inch or so in diameter.

A. NINIAN BRUCE.

REMOVAL OF INTRACRANIAL FOREIGN BODY UNDER X-RAYS.

(273) JOHN ROBERT LEE, *Brit. Med. Journ.*, 1916, March 25, p. 447; *Journ. Roy. Army Med. Corps*, 1916, xxvi., Jan., p. 105.

A SOLDIER received a gunshot wound in France. A piece of shell entered the skull about the middle of the left temporal region. He suffered from sensory aphasia, word-blindness, but no apraxia. The X-rays showed a depressed fracture of the inner table round a small hole in the middle of the squamous part of the left temporal bone, and a piece of shell beneath the surface.

At operation the piece of shell could not be discovered, although 2 oz. of thick pus under pressure escaped. An X-ray later showed the piece of shell had dropped back in the abscess cavity into the occipital lobe. A steel probe was passed down the abscess tract, and an electro-magnet capable of lifting 14 lbs. weight was applied to the probe, and held in position for a few seconds, but the fragment could not be withdrawn. A second attempt was made under the X-ray screen, and it was seen that the fragment of steel had been pulled forward by the magnet, and caught in brain tissue. With a little care it was removed by forceps.

A. NINIAN BRUCE.

CRANIAL TUMOUR (? dermoid by implantation). W. LEDINGHAM (274) CHRISTIE, *Brit. Med. Journ.*, 1916, March 18, p. 416.

A SOLDIER was stunned by the explosion of a shell. A blunt body must have struck the skull, for the skin was slightly wounded. It healed in a few days, but a tumour rose up within five days, and gradually increased to the size of an orange. A skiagram showed a fracture of the skull at the edge of the tumour. It was at first thought to be a meningocele. Several months later it was concluded that the cyst had become shut off from the brain, and an incision was made. The cyst was found to have no brain connection, and peeled off from the bare bone in the centre over the bregma. On opening the cyst, hair and sebaceous matter was seen, and on the wall were a few white projections, but no teeth.

Microscopically it was found to be a simple dermoid cyst lined by about three layers of squamous epithelium, with many sebaceous glands.

As no tumour was noticed before the injury, and as the cyst was on a suture, it was concluded that an embryo dermoid had been incited to grow by the stimulus of the injury.

A. NINIAN BRUCE.

GUNSHOT WOUND OF THE SUPERIOR LONGITUDINAL SINUS. (275) **A report of three cases.** A. W. NUTHALL, *Brit. Med. Journ.*, 1916, Jan. 1, p. 12.

INJURIES of the superior longitudinal sinus have been shown by Holmes and Sargent (*v. Review*, 1916, xiv., p. 5) to give rise to a definite clinical picture—briefly, paralysis with rigidity of the voluntary muscles, with a tendency to progressive recovery without contractures or other permanent nervous defects.

Case I.—A description of a case in a soldier in which the above symptoms were present.

Case II.—This case reached hospital comatose and moribund, and died two hours later. At the autopsy the brain showed a localised contusion which might easily have been recovered from. Death was probably due to hæmorrhage from the longitudinal sinus or to shock.

Case III.—This case died four hours after operation, and was found to have extensive destruction of the brain as well as injury to the sinus.

Holmes and Sargent emphasise the favourable prognosis of injuries to the sinus, but found that the results of surgical interference were very unsatisfactory. The first of these three cases nearly died after operation; the end of the third was probably hastened by operative interference. The author concludes that "the surgeon should hold his hand, until and unless the arrest of hæmorrhage or the relief of definite compression is called for; in other words, there should be no interference."

A. NINIAN BRUCE.

A CASE OF BILATERAL MOTOR APRAXIA WITH DISTURB-
(276) **ANCE OF VISUAL ORIENTATION.** S. SMITH and GORDON HOLMES, *Brit. Med. Journ.*, 1916, March 25, p. 437.

APRAXIA is a complicated condition, but in its simplest terms it consists in inability to combine simple movements into complete purposive acts; in other words, it is a condition in which a patient in whom the power of voluntary movement is intact, is yet unable to perform certain actions, or is incapable of employing objects (such as a knife or key) correctly, even although he is aware what is required of him, and though he recognises the use and the nature of the object. Liepmann, to whom our knowledge of the condition is largely due, has defined motor apraxia as incapacity for subjectively purposive movements of the limbs, with conservation of the power of movement. It may be of different degrees of severity, and may affect the limbs of only one or both sides.

A soldier, aged 27, was admitted to a base hospital with a shrapnel bullet wound in the head. There was no paralysis, but he was dull and confused. The wound of entry was a small puncture behind the nasion, 7 cm. to the right of the middle lines; there was no exit wound, but a small bullet could be felt under the scalp above the left ear. The bullet had just broken through the skull in the left temporal region, and was removed a few days later.

He rapidly improved. In spite of the fact that there was no weakness, ataxia, or sensory disturbance in any of his limbs, he showed a peculiar motor disability which consisted essentially in

an inability to perform certain even simple purposive actions, and to use objects which were familiar to him and which he recognised correctly, *e.g.*, pencil, food, &c. These are described at some length. The lower limbs were also apraxic. There was no trace of tonic or clonic perseveration.

A peculiar disturbance of vision was also discovered, and a number of tests are described showing that objects outside central vision failed to excite his attention, although he was not blind to them, while he was also unable to orientate or localise in space the positions of objects seen in the peripheral parts of the retina, and the relative positions of those that come in succession into central vision.

He consequently presents an apraxia of the oculo-motor movements similar to that described in the limbs, a defect in visual localisation and orientation, and a failure of objects that stimulate the peripheral parts of the retinæ to excite attention and the appropriate ocular movements.

The brain was thought to be entered in the upper and posterior part of the right supramarginal gyrus. The track perforated the falx, passed just dorsal to Wernicke's field in front of the knee of the optic radiations, and made its exit in the inferior part of the left supramarginal gyrus. A. NINIAN BRUCE.

SPINAL CORD, &c.

GUNSHOT WOUNDS AND INJURIES OF THE SPINAL CORD.

(277) JAMES COLLIER, *Lancet*, 1916, April 1, p. 711.

THE following points are considered :—

1. The nature and mechanism of production of the lesions.
2. The state of the reflexes and of muscle tone in the affected region.
3. The distinction between root lesions and central lesions of the cord.
4. Disturbances of sensibility.
5. Prognostic indications.
6. The occurrence of rare and unusual phenomena.

1. The lesions may be roughly classified as follows :—
   - (*a*) Direct lesions.
   - (*b*) Indirect lesions—
     - (i.) Due to indriving of bone, &c., into the spinal canal.
     - (ii.) Impact lesions, where the missile strikes against the bony wall of the spinal cord.
     - (iii.) Concussion lesions, from the shock of high explosives.

(*c*) Secondary lesions, hæmorrhage, œdema, &c.
(*d*) Remote lesions, due to sudden raising of intraspinal pressure caused by passage of missile, or by general concussion effect.

The passage of a fast-moving projectile through a tissue causes not only a heat effect, but an intense raising of the pressure in the tissues, and if the bullet cross the spinal canal, which contains a fluid pressure, this momentary and severe pressure effect is transmitted to the whole of the nervous system confined within the cerebro-spinal space. The intracranial effect of this increase of pressure is the immediate loss of consciousness sometimes met with, and it is possible that the initial loss of consciousness may be an index that the bullet traversed the spinal canal. This certainly holds good for the cervical region. A bullet does not often cross the spinal canal; it is more often deflected by the bony wall. The impact of a projectile upon the bones forming the spinal canal may cause severe lesions of the cord, although the walls of the canal remain intact. This is due to the fact that we are dealing with a rigid wall, the spinal canal, and an elastic wall, the compressible vessels of the cord, &c. The maximum effect of force from one spot on this rigid wall will thus fall on the nearest point of the elastic wall, and produce damage indirectly, with symptoms of total transverse lesion with no recovery, to the slightest lesion with complete recovery.

Concussion may produce severe indirect lesions without any external wound. This may be the result of subluxation of the vertebræ immediately reduced, but during this subluxation the bony rings may produce a severe local transverse lesion of the cord. Possibly they are merely impact lesions.

Intrathecal hæmorrhage tends to find its way into the lowest parts of the thecal space around the cauda equina, and may distend the space, cause pressure on the roots and epiconus and clot, destroying by pressure and evascularisation the cauda equina, and even the lumbar enlargement as well. Smaller effusions may clot and form adhesions, causing local signs of nerve-root involvement.

Total necrosis of the distal segment of the cord may also occur, but is very rare.

Following a transverse lesion of the cord, there may be four consecutive stages in the condition of the plantar reflexes: (1) An initial extensor response. (2) Either a complete absence of any reflex, which may be the result of shock or of isolation, alteration, or a reduced flexion reflex which is the result of isolation alteration, which may come on rapidly. (3) The extensor response which, when persistent, is indicative of a less severe lesion, or alternatively

of more recovery than the reduced flexion reflex. (4) The normal flexion reflex, which returns when recovery is complete. The condition of the plantar reflex is an index of the severity of the damage to the cord, and an important early indication as to whether recovery is occurring or not. The reduced flexor response is a unisegmental reflex involving the first sacral segment only.

Contracture is intimately associated with reflex action. In paraplegia three conditions are to be seen: (1) The dropped foot with retracted toes. This is the ordinary pes cavus of spastic states—the crystallisation of the extensor response. (2) The retracted foot with retracted toes. The calcaneus position is often extreme. The ankle jerk is always lost, and the anterior tibial jerk marked. An extensor plantar response is always present. (3) The dropped foot with dropped toes, the position being similar to that of peripheral neuritis. The plantar reflex is either absent, or there is a reduced flexor response.

The following points may be useful in distinguishing between root lesions and central lesions: (1) In the cervical region extensive root lesions are only met with when there is severe injury of the bones, especially of the transverse processes and spines, and these are recognisable by deformity, swelling and œdema, and radiography in the absence of these signs; an atrophic palsy of the arms is probably the result of a central lesion, if it is extensive. (2) In central lesions the upper limit of the sensory loss is a line more or less transverse to the axis of the limb—"glove" or "stocking" pattern—in contrast to the more or less longitudinal limitation which obtains in root lesions. (3) In the cervical region a relative escape of the long columns, or early signs of recovery in these with severe paralysis of the upper limbs, is in favour of a root lesion, and may suggest the correct diagnosis at an early stage. (4) In the lumbo-sacral region the most certain indication is the level of the wound of the spine, if this can be determined with certainty.

The usually accepted paths of sensation in the cord are: (1) The path for touch is a double one—in the homolateral dorsal column, and in the crossed lateral column. (2) Pain, heat, and cold are conveyed by separate fibres in the crossed ventrolateral column. (3) Sense of position, of passive movement, of vibration, and recognition of form and of the compass points are conveyed in the homolateral dorsal column. There is no crossing below the last dorsal segment. Consequently a unilateral lesion of the cord does not produce a Brown-Séquard's syndrome when the lesion is at the level of the first lumbar segment or below.

Remote pains are very obstinate in some cases. Their mode of origin is obscure. There are three kinds of pain: Dull persistent pain, sharp lancinating pains, and cramp. Three explanations

have been proposed: (1) Irritation of sensory tracts in neighbourhood of lesion; (2) meningeal adhesions and matting of cauda equina by organisation of intrathecal extravasation of blood; (3) muscular rigidity and flexor spasms.

In nearly all cases the initial clinical picture is that of a total lesion of the cord. The reflexes indicate the prognosis. The early reappearance of the plantar reflex if lost at first, and the change from the flexor to the extensor type soon after the seventh day, or the presence of an extensor response earlier than this, are certain indications that the lesion is partial, and that some recovery will occur. Persistent loss of the plantar reflex and long-lasting flexor response are indications that the lesion is severe, and that useful recovery is highly improbable. Early return of the knee jerk and of the ankle jerk is of good prognostic import. Even in the less severe cases the knee and ankle jerks do not return before the fourth day, and their reappearance before this date gives hope that complete recovery may occur.

This paper should be read in the original.

A. NINIAN BRUCE.

BULLET LESION OF CAUDA EQUINA. G. B. HASSIN, K. L. (278) JOHNSTONE, and A. M. CARR, *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 1, p. 1001.

A MAN, aged 28, was shot in the back six years previously. An attempt to remove the bullet four hours after he was shot was unsuccessful. He now complained of unbearable pain from the left buttock to the left popliteal region, from where it would reach the left little toe and spread all over the foot and the rest of the toes. It was paroxysmal, lasting five or ten minutes or so, and he took as much as 30 gr. of morphia daily. On examination the right thigh and the left leg showed muscular atrophy with a claw-like position of the left toes. The patellar and Achilles reflexes were absent on the left side, and only the patellar jerk was present on the right side. The sensibility was merely reduced for pain, touch, and temperature in the areas supplied principally by the last two lumbar and first two sacral roots. In addition there were present localised electrical, vasomotor, and trophic changes. This combination did not conform with any known type of muscular atrophy, and plainly indicated motor involvement of the lower four lumbar and first sacral roots, while the sensory disturbances indicated a lesion of the fourth and fifth lumbar and first sacral roots. An X-ray showed the bullet apparently inside the spinal canal, at the level of the centre of the third lumbar vertebra. Apparently at the time of the original injury a

traumatic myelitis had resulted with total paraplegia and loss of sphincter control, but this had subsided, and only the cauda equina lesion had remained.

The bullet was surrounded by two solid scars, and was removed after laminectomy. Pain disappeared entirely two months later, the gait became practically normal, the calf muscles increased in volume, and sensation returned, but only in the right leg. No change was found in the electrical findings, in the reflexes, or in the muscle power. The patient left hospital and resumed work.

Reference is made to nine other cases from the literature.

A. NINIAN BRUCE.

NERVES.

GUNSHOT INJURIES OF THE PERIPHERAL NERVES: THE (279) **SYNDROME OF COMPRESSION.** JOHN S. B. STOPFORD, *Lancet*, 1916, April 1, p. 718.

THE points raised in this paper are the result of systematic observations on over ninety cases in the hospitals of the 2nd Western Command undertaken for the Medical Research Committee.

The following factors are suggested as influencing the prognosis and treatment:—

1. The extent, character, and distance from the periphery of the injury.
2. Such complications as fracture and sepsis.
3. The treatment before the case comes under observation.
4. The amount of cicatricial tissue formed around the nerve. Excessive fibrosis and the frequency of incomplete division constitute to a considerable extent the differences between war injuries of nerves and those encountered in civil practice.

For convenience the clinical progress, in a large proportion of nerve injuries, may be said to follow one of the four following courses:—

A. Steady and maintained improvement in both motor and sensory manifestations, leading to a complete recovery in four to eight months. Probably these are examples of physiological division.

B. No improvement even after six months. Obviously these are cases of complete anatomical division.

C. Fairly rapid improvement up to a point, when further progress becomes more tardy but slowly continues. These are possibly instances of incomplete anatomical division, but the divided fibres regenerate because they are in good apposition.

D. Improvement which abruptly ceases or is followed by a relapse. The relapse is almost invariably due to compression of the nerve by fibrous tissue or callus.

Five cases are then quoted where nerves have been compressed. In each there is an unusual dissociated type of sensory disturbance, the area in which there is a loss of sensibility to pain (tested by pin-prick) being greater than that in which there is a loss to light touch (tested by a camel-hair brush). This dissociation was found in fifteen additional cases, and in each it developed after the wound had healed.

It is suggested that the first signs of compression are manifested by loss of conduction in the motor fibres and severe pain, which are succeeded by analgesia and diminution (later disappearance) of the subjective pain, and later tactile anæsthesia, which is never so widespread as the analgesia.

AUTHOR'S ABSTRACT.

NEUROSES, &c.

WARFARE NEUROSES OF THE THROAT AND EAR. JOHN F. (280) O'MALLEY, *Lancet*, 1916, May 27, p. 1080.

THE chief neuroses of the throat and ear met with in the present war are:—

1. Functional aphonia.
2. Mutism.
3. Loss of volitional coughing.
4. Functional deafness.

In functional aphonia vocal sounds are absent, the larynx is passive, but whispering, which is produced by the resonating cavities of the pharynx, mouth, and nose, remains. In mutism, both vocal and whispered speech are absent, the larynx and resonating cavities being passive, but the patient may make lip and facial movements as if attempting to speak. Aphonia is the commonest of the neuroses, aphonia with loss of volitional cough comes next, mutism being rarer. Deafness alone is rare, but mutism with deafness seems to be the least frequent of all. Functional aphonia may have a laryngeal catarrh as a physical basis.

The author has treated twenty-four cases in all, of which seventeen were aphonia alone, and only one mutism alone. The

loss of speech was usually treated by asking the patient to phonate with a laryngeal mirror in position. If the cords do not approximate, rubbing the fauces and pharynx usually excite secretion and reflex abduction of the vocal cords with cough.

Functional deafness was treated by exciting the vestibular apparatus as follows: Cold or hot water is allowed to flow in a steady stream into and out of the external auditory meatus by means of a tube attached to a receptacle placed about one and a half to two feet above the patient's head, and continued until he becomes very giddy and an active nystagmus is produced. A speaking tube three feet long is then used by placing the ear-piece in the ear so treated and shouting down it, "You hear now," when the answer "Yes" comes promptly. The tube is now dropped, and a conversation held as if no deafness ever existed.

FUNCTIONAL APHONIA. H. L. WHALE, *Proc. Roy. Soc. Med.*, 1915, (281) viii., June (Laryngol. Sect.), p. 117.

A CASE of sudden aphonia in the trenches without injury. Perfect movement of cords, but in adduction he ceases to expire. Sudden recovery from neurosis in twenty-four hours.

A. NINIAN BRUCE.

A CASE OF SHELL CONCUSSION: TREATMENT BY GENERAL ANÆSTHESIA. (282) G. DE H. DAWSON, *Lancet*, 1916, Feb. 26, p. 463.

A SOLDIER, aged 30, was partially buried in a mine explosion. On admission to hospital he was deaf, dumb, and could not read. Later he passed into a stuporose condition. The onset of these symptoms was delayed until admission to hospital. He was given gas for dental extraction, partly in the hope he would recover his speech by crying out. He was still in rather a shaken state, and the condition was rather aggravated than otherwise, without improvement. He began to slowly improve, could whisper words, but relapsed, becoming sulky, melancholic with inertia, and loss of volition. This improved until he later seemed to lose heart and the will to get better. He was sent to an auxiliary hospital in the country. While there he was given a day's leave, came up to London, and became intoxicated. In this condition he began to laugh and talked aloud. With the restoration of his speech he lost all nervous irritability and sulkiness, and became bright and happy. He, however, remained deaf, and strong galvanic and faradic currents to the ears did not benefit him. He was anæsthetised with gas and ether in bed, went under quietly, and as he was coming round was told he could hear quite well. He became very excited and hysterical, and thence-

forth heard perfectly with his right ear. The left ear showed later all the signs of labyrinthine deafness. Five months had elapsed since his hearing had been lost. A. NINIAN BRUCE.

PERIPHERAL SHOCK AND ITS CENTRAL EFFECTS. J. LYNN
(283) THOMAS, *Brit. Med. Journ.*, 1916, Jan. 8, p. 44.

A COLLIER, one of the survivors in a big colliery explosion, found on recovering consciousness that he could neither hear a sound nor articulate a word. After remaining in this condition for a considerable time he went to a school for the deaf and dumb, and eventually married a congenital deaf mute. He resumed work, and was rendered unconscious for several days by a second underground explosion seven years after the first. On regaining consciousness his power of speech and hearing both returned. His power of singing, however, never came back.

Two types of shock were present in this case—the first occurring suddenly, the second with a latent period. It is only when this latent period is present that the psychic centres are able to exert any influence upon the nervous machinery of the emotions. A. NINIAN BRUCE.

SOME FUNCTIONAL NERVOUS AFFECTIONS PRODUCED BY
(284) **THE WAR.** F. E. BATTEN, *Quart. Journ. Med.*, 1916, ix., Jan., p. 73.

THE cases here described are divided into five groups:—

I. Cases with defined paralytic manifestations, hemiplegia, paraplegia of an hysterical nature (3 cases).

II. Mutism (3 cases).

III. Temporary loss of memory under physical and psychical stress (1 case).

IV. Tremors (2 cases).

V. Unilateral spasm of the muscles of the face and jaw (1 case).

A. NINIAN BRUCE.

A PRELIMINARY NOTE ON THE NATURE AND TREATMENT
(285) **OF CONCUSSION.** T. E. HARWOOD, *Brit. Med. Journ.*, 1916, April 15, p. 551.

IN the treatment of neurasthenic conditions arising in the course of the war one point would appear to have attracted but little attention. Almost every patient will be found to have more or less difficulty with reading. This is usually taken for granted, and passed over as a mere incident. Neurasthenia affects all organs and tissues, although its effects are usually more marked upon some

than others. It causes a lowered efficiency. The ciliary muscle is affected equally with the rest of the body, with the result that the smallest errors of refraction frequently become almost insuperable difficulties. Asthenopia following head injury or concussion is rarely due to any definite injury of the eye or its nerve supply, but simply to an inability of the ciliary muscle to make the smallest effort. Giddiness is far more diagnostic of ciliary paresis than is headache.

By correcting the refractive error the work which the eyes have to do can be reduced to a minimum, and a correspondingly smaller strain incurred. Refractive errors are universal, and only require care and patience to find. The effect of correcting them in acute cases is dramatic, and if patients with head injury or concussion are not rapidly improving, their refraction should be estimated under atropine, and accurate glasses supplied. The object to be aimed at is to leave a minimum, and as far as possible equal, amount of error for each eye to correct.

A. NINIAN BRUCE.

SHOCK AND THE SOLDIER. G. ELLIOT SMITH, *Lancet*, 1916, (286) April 15 and 22, pp. 813 and 853.

THE subject is dealt with under the following headings: The importance of diagnosis, the development of the symptoms, the influence of the individual's life history, the relation of correct diagnosis to treatment, the real trauma is psychical not physical, what should be done with shock cases after discharge from hospital, heredity, treatment, isolation, hypnotic suggestion, and general considerations.

In our system of selecting recruits the man with a varicocele or slight hernia is rejected, while no measures are taken to exclude the mental weakling, and even after such have broken down they are liable to be sent back to the firing line, although useless as combatants.

If the dreams in cases of shell shock be examined it will often be found that such are not merely memories of incidents at the front, but in many cases blended with episodes utterly alien to the war, and tactful cross-examination will often lead up to some event in the patient's past history, the revivified emotions associated with which the war incidents have served to awaken, by stirring up similar emotions. The terms "hysteria," "neurasthenia," &c., are essentially labels given to groups of symptoms after they have become more or less stereotyped and systematised by each individual patient. In cases invalided from the front, this process of systematisation has not gone very far, and by labelling the

outstanding symptom "hysteria," &c., there is a danger of overlooking the essential identity of the fundamental causes and nature of the trouble to be dealt with. The many-sided manifestations of "shock" are in large measure determined by the inherited nature of each individual patient, and by his previous history and experience. In many cases, however, the intensity and horror of the trauma are sufficient to explain the causation and to determine the form of the mental disturbance. As the culmination of months of mental strain and emotional stress some terrifying experience indelibly imprints itself on the patient's mind, and forces him to continue day and night for weeks together, to see again and live the awful moments. His attention becomes wholly concentrated upon this experience, and if left to himself he will systematise these new sensations until they become definite hallucinations and delusions. If these are interpreted to the patient before they are stereotyped, the development of systematised delusions and hallucinations can be prevented. The basis of a delusion is usually a misunderstanding, which could be cleared away if detected early enough.

Many of the troubles from which such patients are afflicted are not in any way indicative of insanity, though the patient thinks they are, *e.g.*, the appearance of pre-sleeping hallucinations to a man who had always been accustomed, before the war, to fall asleep before such intense mental images. Telling a patient who is worrying about such hallucinations that they occur to quite normal people, and explaining them to him, may be sufficient to clear away most of his mental trouble.

While treatment by isolation has obvious advantages in certain cases, in the above it is often dangerous, for it affords the patient every chance to brood upon and cultivate his initially mild derangements.

The strongest man, when exposed to sufficiently intense and frequent stimuli, may become subject to mental derangement. Even those cases where there is a definite history of a neurotic parent should not too hastily be attributed to heredity. For when the detailed history of such patients is obtained, the fact comes out quite clearly that the social disturbances in the household of such a nervous person may be amply sufficient to inflict severe psychical injuries upon young children. Further, in many cases the histories themselves clearly and definitely reveal the real etiology of the mental condition, and point to emotional disturbances in children, due to the cruelty of drunken parents, a rankling sense of injustice, a terrifying experience, which might have been an accident or deliberate maltreatment by some human being, or again, to the appalling conditions created in some of these soldiers'

homes by nervous and irritable parents, as the real trauma which the shock has served to reawaken.

Psychological treatment of this type of case may be divided into two classes: The first believes it is sufficient if the real cause of the trouble is discovered and explained to the patient. The second looks upon the preliminary psychical examination merely as a means of diagnosis, the unveiling of the hidden cause of the trouble, and considers that the treatment should be the laborious and often lengthy process of re-educating the patient, and so restoring to him the proper control of himself. There is, however, no real line of demarcation between the two schools.

In regard to the treatment by isolation of such patients as exhibit hysterical symptoms, a certain proportion do make a complete recovery, but in other cases, especially those where the whole of the symptoms are determined or influenced by the revival of some painful experience of the past, isolation may not only be ineffective, but even positively injurious. For by removing the patient from all distracting influences, you throw him upon his own resources, and practically force him to brood over those very memories which are at the root of all his trouble. The treatment of hysteria by isolation has been developed in civil practice, and the same conditions do not hold for the soldier, as, by bringing him from the trenches to the hospital, you have already removed him from the circumstances causing the breakdown, and as regards discipline and routine he has already been subject to such training. Many men cannot stand isolation for long, and feel that a few hours of freedom would more than compensate for the later punishment.

In the great majority of cases of some considerable duration, and in practically all of those in which the trouble is due to some ante-war worry or emotion, it may be regarded as probable that hypnosis is of no use, and in many cases may be positively harmful, for under such circumstances, even with the most favourable conditions, it would result merely in the removal of symptoms; and the removal of one may be followed by the appearance of another, which may even be induced by the process of hypnosis. Moreover, in cases where there is a tendency to the development of a double personality, hypnosis may have the effect of emphasising the risk. Further, if the patient has sufficient of his own will power to enable the process of re-education to be carried out, it is clearly undesirable, both on psychical and ethical grounds, for the doctor to impress his influence from without.

The incipient forms of mental disturbance which the anxieties and worries of warfare are causing ought to impress upon the attention of every one that such causes are also operating both

in war and peace, and are responsible for a very large proportion of the cases of insanity, and it is precisely these cases which, if diagnosed in the early stages and treated properly, can be cured. The chief hope of reducing the number of patients in asylums for the insane lies in the recognition of this fact, and acting upon it in the way of providing institutions where such incipient cases of mental disturbance can be treated rationally, and so saved from the fate of being sent into an asylum.

A. NINIAN BRUCE.

SPECIAL DISCUSSION ON SHELL SHOCK WITHOUT VISIBLE
(287) **SIGNS OF INJURY.** Opened by Major F. W. MOTT, Major W. M'DOUGALL, Capt. WM. BROWN, Dr STANSFIELD, Capt. WILFRED HARRIS, Dr COLLIER, Mr WALTER H. JESSOP, Dr CAMPBELL THOMSON, Dr DUNDAS GRANT, Dr FEARNSIDES, and Dr LEONARD GUTHRIE, *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Sect. of Neurol. and Psychiat.), pp. 1-44.

Major Mott.—"Shell shock" is a term applied to a group of varying signs and symptoms indicative of loss of function or disorder of functions of the central nervous system, arising from exposure to forces generated by high explosives. In a large number of cases it is accompanied by "burial," and noxious gases may be inhaled while the soldier is lying partially buried. "Psychic trauma" plays a very considerable part in the production of the functional neuroses and psychoses which result. The subject is discussed under the headings of (*a*) disorders and loss of consciousness; (*b*) amnesia; (*c*) psychic trauma and terrifying dreams; (*d*) speech defects; and (*e*) suggestion (*v.* p. 216, Mott, Lettsomian Lectures).

Major W. M'Dougall, who has charge of the Neurological Section at Netley, and thus sees many shell shock cases with symptoms of mental disease in addition to, or in place of, the functional disabilities of mind and body which are the most frequent effects of shell shock, as well as many cases of mental disorder in early stages, usually diagnosed as dementia præcox, melancholia, paranoia mania, and stupor, pointed out that in a large proportion the symptoms clear up very rapidly. He suggests that this is because such persons have constitutions naturally stable and elastic, and which are liable to break down only under the extremely severe shocks and stresses of modern warfare. The leading mental symptoms, such as delusions and hallucinations, are frequently traceable to particular experiences of a vivid and generally distressing kind.

The following is a somewhat typical history :—

A man sustains shell shock and is sent home with some functional disability such as amnesia, mutism, paralysis, or tremor. After some months he returns to the front seemingly cured, and there he very soon develops positive symptoms of mental disease. Or, he passes many months at the front unscathed, until one day a shell explodes near him and merely causes him to be shaky or dazed for a few minutes. From that time he is a changed man; he can no longer come under shell fire without distress; he is always anticipating the shells with dread, and before long he breaks down with hallucinations or delusions, or all the symptoms of mania or of melancholia.

Captain Wm. Brown pointed out that the effects of hypnotism in such cases is not always good, *e.g.*, one patient under this influence found himself back in France again, and found the re-experience so awful that he would not allow it to be repeated. Two cases are quoted to illustrate the fact that mental analysis, or autognosis, proved most helpful, since explaining to a patient the cause of his symptoms, whether hallucinations, delusions, &c., resulted in marked improvement.

Dr Stansfield considers that the psychic effects accompanying shell shock are such as are ordinarily met with in the practice of psychiatry, and are then usually the outcome of stress producing exhaustion in a subject with poor resistance, owing to inherent or acquired defect. The sustained mental tension necessarily associated with life in the firing line, continued for two or three days without sleep, is sufficient to produce marked psychic disturbance in the most robust—varying with the individual—from dulness, retardation, and lethargy, to severe depression with illusions and hallucinations, particularly of sight and hearing. In the case of the psychopathic it is therefore to be expected that the more profound lesions will be developed. The similarity of the symptoms to those frequently found in dementia præcox—apathy, retardation, amnesia, and aphonia—cause one to wonder if the primary and essential causes of this condition had not already been at work, and if the stress in the trenches and under shell fire had only expedited an attack. Two cases are described, one of amnesia following projected suicide, and one of protracted mutism. Faith should not be placed in hypnosis or autosuggestion. Rest and sleep while in the field should be attended to.

Captain Wilfred Harris considers that prolonged mental strain and hard work may break down the nervous stability of even the hardiest individual. Broken sleep, irritability to noise, forgetfulness of engagements, and inability to concentrate attention are prominent features of shell shock. Recovery is apt to be slow. Relapse may follow a vivid dream.

Dr Collier considers that the conscious realisation of the explosion and of its results, the severe sensory stimulation, and the remembrance of these, are the essential factors in the production of the train of functional symptoms under consideration, and that cerebral concussion stands in an antagonistic position to the psychical trauma. For if severe concussion produces immediate unconsciousness at the moment of the explosion, there can be no psychical trauma, and there is no remembrance of the event. Immediate loss of consciousness with symptoms of cerebral concussion only, do not develop the functional symptoms.

Psychopathic and neuropathic antecedents are not of importance as determinants of functional manifestations following shell shock. What seems more important are the proximity of the explosion and the violence of the sensory effect, provided consciousness be retained. Many cases of epilepsy result from shell shock in which no previous taint is present. The low blood pressure in cases of shell shock is remarkable. In only a few is a high tension noted, and these seem to be longer lasting and more resistant to treatment. Functional blindness is rare. Light etherisation in aphonia seems powerless to remove the resistance in the more severe cases, and has the disadvantage that it may produce resentful emotions and loss of confidence on the patient's part if not successful.

Dr Dundas Grant deprecates the employment of violent measures in mutism during the period of exhaustion. He regards these patients as having forgotten how to talk. The first thing to do is to place the back of the patient's hand under the teacher's larynx, so that he may feel the vibrations produced by the utterance of voice; the hand is then transferred to the patient's own larynx. He is encouraged to produce the same feelings, and ultimately the same sort of sound, in the larynx. From this he is gradually led to alter the shape of the mouth cavities for the production of vowels, and later of consonants. In some cases of concussion mutism the voice is restored at one sitting, in others it is gradual.

Stammering may be helped by getting the patient to twirl a button, or make some other muscular movement when he is speaking, or best of all to expand the lower part of his chest.

Dr Fearnsides gives an analysis of 70 consecutive cases arriving directly from France with "special" tickets. In 27 of these the actual shell shock was preceded by a period of nervous instability, 9 were syphilitic in origin, and in 25 the symptoms came on suddenly after a period of good health.

A. NINIAN BRUCE.

THE EFFECTS OF HIGH EXPLOSIVES UPON THE CENTRAL
(288) **NERVOUS SYSTEM.** (**Lettsomian Lectures.**) FRED. W. MOTT, *Lancet*, 1916, Feb. 12, 26, and March 11, pp. 331, 441, and 545 (illust.).

Lecture I.—This lecture deals with the effects of high explosives on the central nervous system, especially when not associated with visible injury and resulting in various functional neuroses and psychoses. Also with the relation of the living neuron to shock, and the theories regarding the causation of instantaneous death of groups of men without outward injury.

The effects of high explosives on the central nervous system fall into three groups:—

1. Those immediately fatal from direct injury by pieces of shell, stones, &c.; burial by mine explosion; or instant death without visible signs of injury to account for it.
2. Those with wounds or injuries to the central nervous system, but without functional disorders or what is termed "shell shock."
3. Those without visible injuries to the central nervous system, but resulting in the various functional neuroses and psychoses.

The different causes which may be responsible for producing these functional disorders are discussed. It is pointed out that the cerebro-spinal fluid is incompressible; it surrounds the central nervous system, fills up the ventricles and the central canal, and all the interstices of the tissues, and under ordinary conditions of pressure from without serves as a perfect protective mechanism. A sudden shock of great intensity, however, would be transmitted through this incompressible fluid, and make itself felt on all the neurons.

The structure of the nerve cell is then described. If the living cell be examined fine dark granules like an emulsion may be seen in the cytoplasm; these possibly represent a large oxygen surface like spongy platinum within the cell. In all active neural processes oxygen is used up, and a violent concussion might quite possibly cause violent oscillations of these delicate granules, and a loss or disturbance of their functions of variable duration. A continuous supply of oxygen is essential for consciousness. The intercalary neurons, however, have no store of oxygen in their cytoplasm, and depend upon a continuous renewal of the oxygen in the circumambient fluid. Now a violent emotion such as fright can by its influence on the vaso-motor centre and heart cause a fall in the blood pressure, lowering of the oxygen tension in the fluid, and suspension of function of the intercalary neurons of the cortex, followed by dissociation of the cortical perceptors and loss of consciousness.

The theories regarding the causation of instantaneous death of groups of men without any visible injury are :—

1. Commotion from the aerial compression.
2. Concussion with or without burial.
3. Decompression with embolism, by bubbles of N and CO_2.
4. Inspiration of CO during the aerial compression.
5. Prolonged inhalation of noxious gases—*e.g.*, CO—while lying unconscious or partially buried.

Lecture II.—The histological changes in the brain in CO poisoning, shell shock, and spinal concussion are described. They resemble each other closely, and consist of multiple punctate hæmorrhages with marked chromatolysis of the cells of the medulla oblongata, and eccentric position of the nucleus, &c. If it be assumed that the substance which forms the Nissl granules is an indication of the amount of kinetoplasm in the neuron, this substance disappears in both CO poisoning and shell shock with burial. The cause of this change in the gas poisoning is due to vascular stasis and lack of oxygen, and thus probably the similar change in the medulla in shell shock with burial is due to inhalation of sufficient CO to produce fatal effects before excavation can be effected. The amount of CO produced by the imperfect detonation of high-explosive shells is sufficient to cause poisonous effects.

The mental and bodily condition of the individual at the time of receiving the shock is very important, and may be classified as follows :—

1. *Inborn.* — (*a*) A timorous disposition and an anxious temperament.
   (*b*) A neuropathic or psychopathic inheritance.
2. *Acquired.*—(*a*) *A locus minoris resistentiæ* in the central nervous system in consequence of alcoholism, syphilis, or previous head injury.
   (*b*) A lowered neuro-potential, the result of a post-febrile neurasthenia.
   (*c*) Nervous exhaustion, the result of mental stress, anxiety, insomnia, and terrifying dreams.
   (*d*) Bodily exhaustion from fatigue, cold, wet, and hunger.

Most cases of so-called shell shock admitted with functional neuroses either had a nervous temperament or were the subjects of an acquired or inherited neuropathy. Repeated and prolonged

exposure to shell fire may, however, produce a neurasthenic or hysterical condition in a potentially sound individual. Dr Mott had never seen a case of functional paralysis or mutism in an officer.

Cases developing epilepsy as the result of shell shock are generally individuals who were either epileptics or potential epileptics prior to the shock. A brief summary is given of the pre-war history in twenty-five cases of epilepsy supporting this statement.

Lecture III. deals with the symptoms of "shell shock."

(*a*) *Amnesia.*—Loss of memory may be a complete loss of power of recollection and of recognition. Consciousness, except for the immediate present perception, may be a blank, and the patient exhibits a dazed, mindless expression. Three such cases are described, in two of which the musical memory returned early, possibly because it is associated with feeling.

(*b*) *Psychic Trauma and the Effects Produced by Terrifying Dreams.*—The frequency of terrifying dreams in these cases points to the conclusion that a psychic trauma is exercising a powerful influence on the mind by the thoughts reverting to the terrifying experiences undergone, and their continuous influence on the subconscious mind may account partially for the terrified or vacant look of depression on the face, the cold blue hands, feeble pulse and respiration, sweats and tremors, some or all of which, the signs of fear, the severer cases manifest. As these dreams cease to disturb sleep, these manifestations of fear tend to pass off. Several illustrative cases are described.

(*c*) *Speech Defects.*—The common forms are mutism, aphonia, stammering, stuttering, and verbal repetition. Mutism is the most common of these, being present in about one in twenty cases suffering from shell shock. Hearing is usually unaffected. The sudden and varied manner in which these mutes recover their speech is indicative of a refractory condition of the voluntary cortical mechanism of phonation. One man recovered his speech on being nearly throttled, when he struggled and shouted "Stop it." Another dreamt he was falling over a cliff, shouted out, and recovered his speech. Another dreamt he was blown up by a trench mortar, and shouted for help. Another was heard to speak in his sleep, and on being told so said, "I don't believe it." Another when some boiling tea was spilt over him. A mute sergeant, seeing some men larking in a punt, suddenly shouted, "You will be over." In most cases it is the sudden and unexpected which restores the function of the vocal mechanism. This mutism is due to emotional shock; it is a psychic rather than a physical trauma, and does not differ from hysterical mutism of Bastian. Two grades may be

observed: *aphonia*, in which phonation is extremely weak; and *mutism* which is a complete loss of the power of phonation.

(*d*) *Headache* is commonest in the occipital region and the back of the neck. It may be frontal, in the temples or back of the eyes. It is usually worst at night, and may be associated with thoughts of terrifying scenes.

(*e*) *Cardiac and Vaso-Motor Disturbances.*—The blood pressure is never high, and the temperature of the hands may be low.

(*f*) *Sensory Disturbances* are variable.

(*g*) *Hearing and Vision.*—Both may be lost, and, like speech, may return suddenly.

(*h*) *Tremors* are extremely common, and constitute a serious disability. They are usually coarse, like paralysis agitans. A case cured by strong suggestion is recorded.

(*i*) *Functional Paralysis—Gait.*—The commonest is paraplegia. Suggestion of injury plays a very important part in causing and maintaining a fixed idea of paralysis. The essential point, in the treatment of all these cases, is to be cheerful. Hypnosis or psycho-analysis are not necessary or even desirable. An atmosphere of cure about the ward is the important point, with means for the diversion of the mind from the terrifying experiences impressed upon it. A. NINIAN BRUCE.

CHANGES IN THE CENTRAL NERVOUS SYSTEM FOLLOWING
(289) **SPECIAL TRAUMATIC DISTURBANCES. (Alterazioni nel sistema nervoso centrale consecutive a particolari commozioni traumatiche.)** G. D'ABUNDO, *Riv. ital. di Neuropatol., Psichiatr. ed Elettroter.*, 1916, ix., p. 145.

FOR the purpose of studying the phenomena of shock, D'Abundo submitted guinea-pigs to centrifugalisation for periods varying from 30 to 120 seconds. When removed from the centrifugaliser the animals were in a fainting condition. Sometimes they showed transient and intense rotatory movements round their vertebral axis; there were almost always more or less marked exophthalmos, sometimes of one eye more than of the other; lateral deviation of the neck, usually to the left; sometimes a lateral tic of the head; almost invariably vertical nystagmus, rarely horizontal nystagmus; loss of reaction to various stimuli; marked increase of the respiratory movements, and of the heart beats; often, but not always, lowering of the rectal temperature by 2° C., especially in very young subjects, and very frequently hæmorrhages from the conjunctival, nasal, and buccal mucosæ and subcutaneous hæmorrhages from the pinnæ.

The state of prostration was proportioned to the time that the animals had been kept in the centrifugaliser. They were placed

in it daily, and some resisted ninety-seven days and were then killed. Emaciation was common in adult animals, and the growth of young animals was remarkably retarded.

Necropsy.— On macroscopical examination there was considerable congestion, with multiple hæmorrhages in the cerebro-spinal meninges, as well as in the internal organs. Histological examination of the central nervous system confirmed the macroscopical findings.

The anatomical lesions of the central nervous system in centrifugalised guinea-pigs were thus identical with those found in men who had been wounded by the explosion of large projectiles. J. D. ROLLESTON.

MENTAL CONDITIONS FOLLOWING STRAIN AND NERVE SHOCK. (290) R. G. Rows, *Brit. Med. Journ.*, 1916, March 26.

THE author, who is in command of the Military Hospital, Maghull, draws attention to the unique opportunity afforded by war conditions of studying psychic disturbance in the early uncomplicated phase.

Disturbances of an intense nature may result from shock, and, as in civil life, may disappear under rest and quiet in hospital. Unfortunately, however, partial recovery only may take place accompanied by a change in feeling tone, or change in personality acutely appreciated by the patient himself. From this arise anxiety and apprehensiveness.

In some cases a morbid emotional state, occasioned by a special emotion such as fear or terror, may persist, and tends to be linked up with the memory of some past incident of a disturbing nature. Marked improvement can be effected by scientific examination back to the period of the disturbing incident, accompanied by an explanation of the causative psychogenetic mechanism. Sometimes the mental disturbance is complicated by hallucinations and dreams, and here again improvement follows when the mechanism of the disorder is explained to the patient.

The mental illness is frequently prolonged by the memories of past experiences of an emotional nature which assume undue importance in the patient's consciousness, and at times are revived in dreams. These memories of past events can be added to those of more recent events which occurred during the war, conferring upon the latter a greatly exaggerated emotional tone.

From the cases illustrating the above points the writer concludes that the term "shock" is inadequate to explain all the conditions arising in the morbid mental state of those who are

returned from the front, and draws attention to the importance of the morbid "residuum" in the mental phenomena remaining after partial recovery. The cause or causes of this residuum must be investigated, and it will frequently be found that, owing to the lowered self-control induced by the effects of war conditions, a feeling of apprehension and of change of personality assert themselves, which are recognised but cannot be explained by the patient. All incidents, therefore, associated with heightened emotional tone become unduly prominent, and maintain the morbid state by fixing the patient's attention in this direction. Hallucinations and delusions may then follow as a result of the patient's attempts to explain his altered personality to himself, and it is at this stage that psycho-therapy becomes most useful by the physician explaining in simple language the mechanism of the trouble, thus enabling the patient to recognise the true relation of cause and effect in the origin and development of his illness. Once this confidence of the patient has been gained by sympathetic treatment and patience, the process of re-education may be pursued. DAVID ORR.

(291) **MENTAL DISTURBANCES FOLLOWING THE SHOCK OF MODERN EXPLOSIVES. (Les troubles mentaux consécutifs au shock des explosifs modernes.)** P. VACHET, *Thèses de Paris*, 1915-16, No. 15.

SOME form of mental confusion is most frequently met with; occasionally a melancholic syndrome is found. Grave forms are exceptional; mild attacks are much more frequent. Sensory or motor symptoms may be absent, but sometimes coexist or develop subsequently, thus necessitating a guarded prognosis. The patients should, as a rule, be regarded as cases of organic disease, and treated as such. They should not, however, be sent far into the interior, but should be kept near the front, as recovery under such conditions is much more rapid. J. D. ROLLESTON.

(292) **MENTAL DISTURBANCES IN WAR TIME. (Disturbi mentali in tempo di guerra.)** V. M. BUSCAINO and A. COPPOLA, *Riv. di patol. nerv. e ment.*, 1916, xxi., pp. 1-103, 135-182.

THE paper is based on the study of cases admitted to Professor Tanzi's clinique at Florence between July 1914 and October 1915, and contains a review of the literature and a lengthy bibliography. Forty-seven original cases are recorded and classified in three groups: (1) Soldiers who were admitted during the long period of gradual mobilisation and had not been to the front. These consisted

chiefly of cases of "neuro-psychopathic constitution," dementia præcox, and alcoholism. (2) Soldiers who had been to the front and who had actually taken part in battle, or had only had a vivid impression of it. (3) Civilians, refugees, and hostages. In the last two groups depressive and confusional states were most frequently found, the latter occasionally presenting a hysterical colouring in soldiers returning from battle.

The writers' conclusions are as follows: The mental disturbances which occur in war time, both in the army and in the civil population, may be divided into two groups. In the first, the mental syndrome is the direct and exclusive consequence of an external and physical factor. In such cases, which are uncommon, mental disturbances, generally in the form of loss of consciousness, are caused in perfectly sane persons by the explosion of a large projectile or a mine. In the second group, which is by far the most frequent, the syndrome is the result of the simultaneous action of two factors, or two complexes of factors, one exogenous, physical, or psychical, and the other endogenous, constituted by a specific predisposition and not revealed by psychical manifestations.

The writers' cases clearly show the great importance of congenital or acquired predisposition. War has only a psychopathogenic action, which affects a restricted number of individuals when associated with other morbid factors, congenital or acquired. J. D. ROLLESTON.

(293) **MENTAL DISEASES IN THE ARMY IN WAR TIME (AUGUST 1914—OCTOBER 1915). (Contribution à l'étude des maladies mentales dans l'armée en temps de guerre. Août 1914 à Octobre 1915.)** F. M. A. BOUCHEROT, *Thèses de Paris*, 1915-16, No. 37.

107 soldiers were admitted to the Loiret Asylum between 1st August 1914 and 1st October 1915. All were suffering from well recognised forms of mental disease, and no special war psychosis was observed (*v. Review*, 1916, xiv., p. 54). Depressive states predominated (twenty-five cases). Alcoholism (seventeen cases), which was most prevalent at the beginning of the war, was chiefly noted among the men remaining in the depôts. A certain number of patients had previously been in an asylum, and had a recurrence of their mental disorder on the outbreak of war. Examples of morbid lack of discipline were chiefly observed among the cases of dementia præcox (eight cases), or general paralysis (four cases) in an early stage.

The writer insists on the importance of a psychiatric staff for the early recognition and treatment of mental disease in the army in war time. J. D. ROLLESTON.

A DESCRIPTIVE RECORD OF THE CONVERSION OF A COUNTY
(294) **ASYLUM INTO A WAR HOSPITAL FOR SICK AND WOUNDED SOLDIERS IN 1915.** D. G. THOMSON, *Journ. Ment. Sci.*, 1916, Jan., p. 109.

USE OF ASYLUMS AS MILITARY HOSPITALS. WILLIAM
(295) VINCENT, *Journ. Ment. Sci.*, 1916, Jan., p. 174.

IN both these articles the various changes, administrative and otherwise, necessitated by the conversion of an asylum into a military hospital are fully detailed. H. DE M. ALEXANDER.

"TRENCH FOOT."

REPORT ON "TRENCH FOOT." W. WALLER and F. K. RIDEAL, *Journ.*
(296) *Roy. Army Med. Corps*, 1916, xxvi., May, p. 635.

THE authors suggest that a salted ointment, such as salted lard, would be beneficial in protecting the feet against water. The salt would further act as an antiseptic. A liberal amount of ointment would be necessary, *e.g.*, 100 gm. for each leg with 5 or 10 per cent. salt.

All other practical precautions would, of course, be taken, such as foot inspection, so as to ensure the men using the ointment, provision of dry socks with the waterproof trench boots, loosening of the puttees, &c.

Officers' spiral puttees contract 5 or 6 per cent. of their length when they are soaked in water. A. NINIAN BRUCE.

MENINGITIS.

MILD MENINGOCOCCAL SEPTICÆMIA OF INTERMITTENT
(297) **FEVER TYPE FOLLOWING CEREBRO-SPINAL MENINGITIS. RECOVERY. (Méningococcémie bénigne à type de fièvre intermittente consécutive à une méningite cérébro-spinale. Guérison.)** J. BAUR, J. SEVESTRE, and J. HUTINEL, *Ann. de Méd.*, 1915, ii., p. 589.

A SOLDIER, aged 30, about a week after recovery from cerebro-spinal meningitis, developed a febrile attack resembling malaria, as in the case reported by Chevrel and Bourdinière (*v. Review*, 1910, viii., p. 703). Blood cultures showed the presence of the meningococcus. J. D. ROLLESTON.

LATENT CEREBRO-SPINAL MENINGITIS. (Méningites cérébro-
(298) **spinales latentes.)** BONNEL and E. JOLTRAIN, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 75.

A RECORD of three cases in soldiers, in one of whom the outbreak resembled typhoid fever, and in the other two malaria. Subse-

quently, a slight nuchal rigidity was observed, and a turbid cerebro-spinal fluid was withdrawn on lumbar puncture. Rapid recovery followed injection of anti-meningococcal serum in each case. J. D. ROLLESTON.

A CASE OF HYPERACUTE CEREBRO-SPINAL MENINGITIS
(299) **WITH ABSENCE OF CEREBRAL SYMPTOMS: MENINGOCOCCUS ISOLATED FROM THE BLOOD.** H. H. SCOTT, *Journ. Roy. Army Med. Corps*, 1916, xxvi., p. 394.

A SOLDIER was in normal health till 7 P.M. on 15th December, when he had a rigor, and the temperature rose to 104°. He made no definite complaint, and the temperature fell to 102° on the 16th. When seen at 4 P.M. on the 16th he presented an extensive purpuric eruption on the trunk, and still more so on the limbs, and intense hyperæsthesia of the trunk below the level of the superior iliac spines, and of the lower limbs. There was no vomiting, headache, convulsions, or delirium, and the mind remained clear until death, which took place twenty-five hours after the onset.

The autopsy showed congestion of the meninges. Their surface was generally œdematous, and there was dulling of the membranes over the inter-peduncular space and inferior surface of the cerebellum. On section the brain appeared congested. There was no obvious excess of fluid in the ventricles, and no pus. There was marked congestion of the spinal dura, and of the cord itself. The cerebro-spinal fluid was turbid, and showed leucocytes crowded with meningococci, which were also found in the heart blood. J. D. ROLLESTON.

MENINGOCOCCAL MENINGITIS AND TUBERCULOSIS. (Ménin-
(300) **gite méningococcique et tuberculose.)** P. SAINTON and J. MAILLE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 108.

A RECORD of two cases.

Case I.—Soldier, aged 21. The onset was that of acute gastritis, and it was only after three weeks that meningeal symptoms appeared. The cerebro-spinal fluid was turbid, and showed a predominance of lymphocytes with a few polymorphs, and typical meningococci. Some improvement followed serum treatment, but death took place. In addition to meningococcal meningitis, the autopsy showed miliary tuberculosis of the lungs and meninges.

Case II.—Soldier, aged 24. The clinical symptoms at first resembled typhoid fever, and later cerebro-spinal meningitis. Post mortem, the lesions were identical with those of the first case, except that the meningeal and pulmonary lesions were more discrete. J. D. ROLLESTON.

MENINGOCOCCAL ARTHRITIS OF THE SHOULDER OF A
(301) **PLASTIC ANKYLOSING FORM, FOLLOWED BY PULMONARY MANIFESTATIONS AND MENINGITIS. POST-MENINGITIC ARTHRITIS OF THE KNEE. CONJUNCTIVITIS AND IRIDOCHOROIDITIS. COMPLICATIONS OF SERUM TREATMENT. (Arthrite méningococcique de l'épaule à forme plastique ankylosante. Manifestations pulmonaires et méningite consécutives. Arthrite du genou post-méningitique. Conjunctivite et iridochoroidite. Incidents sérothérapiques.)** P. SAINTON and J. BOSQUET, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 344.

THE patient was a soldier, aged 35. The iridochoroiditis was successfully treated by subconjunctival and intravenous injections of anti-meningococcal serum according to Netter's method.

Although the patient had never had any previous injection, the first intraspinal injection was followed by convulsions, cyanosis, and collapse, and similar symptoms, but without convulsions, followed an intravenous injection. J. D. ROLLESTON.

THE SUBACUTE FORM OF MENINGOCOCCAL PYARTHROSIS.
(302) **(La forme subaiguë de la pyarthrose méningococcique.)** P. SAINTON, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 351.

THERE are certain forms of meningococcal infection of the joints, the slow evolution of which may be compared to that of certain varieties of tuberculous or gonococcal arthritis. Sainton records a fatal case in a soldier in which arthritis of the wrist preceded meningitis. The autopsy showed pus in the wrist containing numerous meningococci as well as typical meningococcal meningitis. J. D. ROLLESTON.

TREATMENT OF CEREBRO-SPINAL MENINGITIS BY DORSAL
(303) **PUNCTURE. (Traitement de la méningite cérébro-spinale par la ponction dorsale.)** CHARTIER, *Rev. de méd.*, 1914-15, xxiv., p. 585.

A RECORD of two fatal cases in young soldiers. In neither could more than a few c.c. of fluid be removed by lumbar puncture. On the other hand, dorsal puncture, performed in the seventh or eighth intervertebral space, exactly in the midline, gave issue to 70 c.c. or 80 c.c. of cerebro-spinal fluid, and 60 c.c. of serum was very easily injected. Both showed a transient improvement after the injection, but died the following day.

The danger of injuring the cord in dorsal puncture can be avoided by blunting the extremity of the needle. Further, the distension of the subarachnoid space, and the thickening and infiltration of the pia mater, serve as a natural protection to the cord. J. D. ROLLESTON.

THE INCLINED VENTRAL POSITION IN THE SERUM TREAT-
(304) **MENT OF CEREBRO-SPINAL MENINGITIS. (La position ventrale inclinée au cours du traitement sérique de la méningite cérébro-spinale.)** F. RAMOND, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 297.

RAMOND found that serum coloured by methylene blue when injected in the ordinary dorsal position, both *in vivo* and post mortem, was mainly carried to the posterior part of the bulb, cerebellum, and cerebrum, and only very slowly reached their anterior aspect. He therefore recommends the following procedure: as soon as 20 to 40 c.c. of serum have been injected, the patient is put in the ventral position, the pelvis is raised, and the head lowered for 20 to 30 minutes; he is then placed in the dorsal position for the same length of time. In this manner the serum reaches alternately the anterior and posterior collections of pus, and the results obtained have been better. J. D. ROLLESTON.

CONGESTION IN THE TREATMENT OF CASES OF CEREBRO-
(305) **SPINAL MENINGITIS.** DUNCAN FORBES and EVELINE COHEN, *Lancet*, 1916, May 27, p. 1075.

FIVE cases are recorded to show that congestion of the cerebral vessels, by raising the foot of the bed to an angle of 14° to 23° with the floor, may influence the course of the disease profoundly. In mild cases, in a few days, a normal temperature and free movement of the head result, and the recovery is uninterrupted. In more severe cases the temperature rises, and the patient more gradually recovers, the recovery being at first accompanied by either, or both, increased tension of cerebro-spinal fluid, and a greater migration of polymorphs. If the foot of the bed has been raised too high there may be very severe headache and persistent vomiting, due to a too great congestion and its results. In such cases, if the bed is lowered and the tension is relieved by puncture, the patient gradually recovers. An acute or sub-acute case threatening to become chronic is specially benefited by this treatment.

A. NINIAN BRUCE.

METASTATIC ENDOPHTHALMITIS IN A CASE OF CEREBRO-
(306) **SPINAL MENINGITIS** LEONARD WEAKLEY, *Brit. Med. Journ.*, 1916, Jan. 8, p. 47.

A SOLDIER, aged 19, developed cerebro-spinal meningitis in Egypt, following pneumonia on the voyage from Australia. The cerebro-spinal fluid was under pressure, turbid, clotted rapidly, and gave a pure culture of the meningococcus. The left eye was then noticed to be inflamed and covered with thick grey-yellow exudate. There

was also partial left-sided facial paralysis. A pure growth of the meningococcus was obtained from the interior of the eye.

The general treatment was to draw off 15 to 20 c.c. of cerebro-spinal fluid and replace it with an equal amount of anti-meningococcus serum about every two days. The eye symptoms rapidly passed off, and a general recovery was made.

A. NINIAN BRUCE.

A CASE OF SEROUS TYPHOID MENINGITIS. (Ein Fall von
(307) **meningitis typhosa serosa.)** J. Löw, *Wien. klin. Woch.*, 1915, **xxvii.**, p. 559.

A SOLDIER had an attack of typhoid fever, the febrile period lasting twenty-five days. About three weeks after the temperature had become normal he developed symptoms of meningitis. Lumbar puncture gave issue to a slightly turbid fluid under some hypertension containing only a few cells but numerous micro-organisms, which proved to be typhoid bacilli. Rapid improvement followed lumbar puncture, and complete recovery took place in a few days.

The late occurrence of the meningitis is remarkable, as typhoid meningitis usually occurs in the febrile period.

J. D. ROLLESTON.

ACUTE PRIMARY SUPPURATIVE CEREBRO-SPINAL MENIN-
(308) **GITIS DUE TO THE PARATYPHOID A BACILLUS. MENINGO-PARATYPHOID A. (Méningite cérébro-spinale aiguë suppurée primitive à bacille paratyphique A. Le méningo-paratyphus A.)** TOLMER and R. J. WEISSENBACH, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, **xxxix.**, p. 1267.

A SOLDIER admitted to hospital with bronchitis developed symptoms of meningitis the following day. Lumbar puncture gave issue to a greenish turbid fluid containing a large quantity of albumin and disintegrated polymorphs. Coma supervened, and death took place in less than forty-eight hours from the onset of the meningeal symptoms. The autopsy showed diffuse meningitis, broncho-pneumonia, and superficial ulceration of the lymphoid tissue of the lower end of the ileum. The paratyphoid A bacillus was isolated from the cerebro-spinal fluid during life, and post mortem from the spleen, the cerebro-spinal fluid in the basilar region, lateral ventricles, and bronchus. No other case of suppurative meningitis due to the paratyphoid A bacillus has been recorded.

J. D. ROLLESTON.

A SMALL EPIDEMIC OF THE MENINGEAL FORM OF PARA-
(309) **TYPHOID B. (Petite épidémie de paratyphoïdes à forme méningée.)** G. LAROCHE and LECAPLAIN, *Paris méd.*, 1915, v., p. 565.

THE writers allude to the cases reported by Sacquépée (*v. Review*, 1911, ix., p. 327) and others, and record seven cases in soldiers. In three the diagnosis from cerebro-spinal meningitis would have been impossible without bacteriological examination, as meningitis only was present. In three more or less marked symptoms of typhoid fever were associated with the meningitis, and in one case gastro-intestinal symptoms predominated. Only slight changes were found in the cerebro-spinal fluid, viz., more or less increase of albumin, slight or intense lymphocytosis, a very small number of polymorphs, and occasionally absence of any cells whatever. The blood serum test for paratyphoid B was positive, but cultures of the cerebro-spinal fluid were negative in every case.

J. D. ROLLESTON.

SUBACUTE TYPHOID SEPTICÆMIA WITH MENINGEAL AND
(310) **PLEURAL MANIFESTATIONS SIMULATING TUBERCULOUS MENINGITIS AND PLEURISY. (Septicémie éberthienne subaiguë à manifestation meningée et pleurale simulant la méningite tuberculeuse.)** F. COTTEN and P. GASTINEL, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 91.

A SOLDIER was admitted to hospital with symptoms of meningitis. Lumbar puncture gave issue to a clear, slightly albuminous fluid without hypertension, showing a predominance of lymphocytes and a few polymorphs. Cultures showed the presence of typhoid bacilli. No other symptoms of typhoid fever developed. Pleurisy with effusion from which typhoid bacilli were cultivated, ensued, and was followed by periostitis of the tibia, which persisted for several months.

J. D. ROLLESTON.

A FATAL CASE OF MENINGITIS IN MUMPS. (Un cas mortel
(311) **de méningite ourlienne.)** R. VOISIN, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 223.

A SOLDIER, aged 34, belonging to a company in which there was an epidemic of mumps, was admitted to hospital in a comatose state, with deviation of head and eyes to the right, rigidity of the neck and limbs, and Kernig's sign. There was a slight degree of parotid enlargement, which became more marked the following day. Lumbar puncture gave issue to a turbid fluid, showing a predominance of polymorphs and a few mononuclears, but no

micro-organisms. Death took place on the third day of disease. The autopsy showed generalised meningitis of the brain and cord. No micro-organisms could be found in the pus examined post mortem. J. D. ROLLESTON.

CLINICAL SYNDROME OF CERVICAL RHEUMATISM ASSOCI-
(312) **ATED WITH SCIATIC NEURALGIA. MENINGEAL RE-ACTION. CARDIAC COMPLICATIONS. DIAGNOSIS FROM CEREBRO-SPINAL MENINGITIS.** (**Syndrome clinique de rhumatisme cervical et de névralgie sciatique associées. Réactions méningées. Complications cardiaques. Diagnostic avec la méningite cérébro-spinale.**) P. NOBÉCOURT, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 20.

A RECORD of 19 cases in soldiers, in 16 of whom cervical rheumatism was associated with sciatic neuralgia, and in 3 cervical neuralgia alone existed. The cerebro-spinal fluid in the 12 cases in whom it was examined showed hypertension and increase of albumin, but no lymphocytosis and no micro-organisms. Five cases developed cardiac complications, which Nobécourt attributes to acute articular rheumatism. The localisation of the cervical pain, the difficulty in the movement of rotation of the head, with almost complete preservation of the movement of flexion, the absence of true nuchal rigidity and of Kernig's sign, and the character of the cerebro-spinal fluid, are sufficiently characteristic to distinguish the syndrome from cerebro-spinal meningitis.

J. D. ROLLESTON.

A METHOD FOR THE RAPID PREPARATION OF ANTI-
(313) **MENINGITIS SERUM.** HAROLD A. AMOSS and MARTHA WOLLSTEIN, *Journ. Exper. Med.*, 1916, xxiii., p. 403.

POTENT antimeningitis serum can be safely produced in the horse by the method of three successive intravenous inoculations of living meningococci and parameningococci repeated at stated intervals.

Sudden and alarming symptoms and sudden death are avoided by employing first a desensitising injection, and then by adjusting the doses according to the febrile reaction, and by making the highly diluted injections slowly.

Horses undergoing this process of immunisation remain in good condition, and may even gain in weight.

Specific immune bodies appear in the serum early and rise rapidly.

By inoculating alternately several strains of living meningococci and parameningococci, and the autolysed products of each a

polyvalent serum of high titre can be produced in eight to twelve weeks instead of in the ten months required by the subcutaneous method.

The serum produced by this rapid method has been employed therapeutically in America, England, France, and some other countries.

It is highly desirable to isolate meningococci from many sources and test the strains against the polyvalent serum. Strains which are not agglutinated in high dilution in such a serum should be included subsequently in the lot of strains used for immunisation. A. NINIAN BRUCE.

CHEMICAL *VERSUS* SERUM TREATMENT OF EPIDEMIC
(314) **MENINGITIS.** SIMON FLEXNER and HAROLD L. AMOSS, *Journ. Exper. Med.*, 1916, xxiii., May, p. 683.

NEITHER lysol nor protargol have any beneficial or curative action in experimental meningococcic infection in guinea-pigs and monkeys. They rather show a reverse tendency. Both are antileukotactic and antiphagocytic, and are also potent protoplasmic poisons, and the leucocytes with which they come in contact are injured and made to degenerate. According to the extent to which these harmful properties are exerted, the chemicals promote the advance rather than restrain the progress of meningococcic infection.

Recovery from meningococcic infection in man and animals is accomplished chiefly by phagocytosis. The specific antiserum acts curatively by increasing the emigration of leucocytes, by promoting phagocytosis directly, and by agglutinating the meningococci, and also by neutralising endotoxin. The mixture of antiserum with lysol and with protargol reduces to a certain extent the antileukotactic and antiphagocytic effect of the chemicals, but the benefit from the antiserum is more than offset by the harmful effects of the chemicals.

Hence specific antiserum seems to provide the logical therapeutic agent with which to combat epidemic meningitis, since it is itself innocuous, and promotes those processes essential to recovery from the disease. The problem has been that of producing an antiserum which represents the several types of the meningococcus, and this is now in a fair way to being solved.

A. NINIAN BRUCE.

EPIDEMIC CEREBRO-SPINAL FEVER. The place of the meningo-
(315) **coccus in its etiology.** EDWARD C. HORT, *Brit. Med. Journ.*, 1916, Jan. 29, p. 156; *Journ. Roy. Army Med. Corps*, 1916.

"THERE is at present available no adequate evidence to show that the meningococcus of Weichselbaum is itself the causal agent of the

disease cerebro-spinal fever. On the contrary, the experimental evidence recorded in this paper distinctly suggests it is not. The fresh filtrate of cerebro-spinal fluid in two cases examined contained a virus which was highly infective to monkeys. The true bacterial content of the body fluids in this disease can only, as a routine procedure, be satisfactorily determined by, in the first instance, using the fluids themselves as the optimum medium of growth, combined with injection into suitable animals in the fresh condition. Incubation of the body fluids, infective to monkeys in the unincubated state, appears to destroy their infectivity, and, in so doing, to throw some light on the ancestry of the meningococcus."

Although the meningococcus appears to be incapable of reproducing the disease, the search for and isolation of carriers should be pursued, since its presence is a valuable danger signal that the true infective agent is present. Attempts to prepare antiserums to the meningococcus do not appear likely to lead to effective therapeutic control. Confirmation of the infectivity of fresh cerebro-spinal fluid would justify the preparation and trial of effective antiserums thereto in the treatment of the disease. To discover the true infective agent, attention should be paid to filterable organisms in the naso-pharynx and cerebro-spinal fluid of acute cases. A. NINIAN BRUCE.

TETANUS.

MENTAL SYMPTOMS COMPLICATING A CASE OF ACUTE
(316) **TETANUS DURING TREATMENT BY CARBOLIC INJECTIONS.** JOHN EVERIDGE, *Brit. Med. Journ.*, 1916, March 25, p. 443.

A SOLDIER was severely wounded in the right buttock, right thigh, right foot, and in the left leg, by high explosive. The wounds were extremely septic five days later. Next day, *i.e.*, *six* days after the wound, some trismus and a definite risus sardonicus were noted. He was treated with anti-tetanic serum subcutaneously and ice, of 1 in 20 carbolic acid every four hours, with later, morphia, chloral, and bromide. He remained in a semi-comatose state in consequence, but whenever he was allowed to come round at all, the spasms became intense. Eight days later the attack began to pass off, and his mental condition suddenly changed. He became extremely restless, and passed into a state of low, muttering delirium with visions and hallucinations—a condition closely resembling delirium tremens. This lasted five days, during which he had incontinence of urine and fæces. Chloral and bromide had no effect, but paraldehyde now proved successful. Return to his normal mental state was slow, and was complicated by one relapse, which was acute for three days.

The condition was not attributed to either shell shock or to the tetanus itself. It was thought that perhaps the carbolic acid injection might not be unassociated with it, although there were no other symptoms of carbolic acid poisoning.

A. NINIAN BRUCE.

REPORT OF A CASE OF SEVERE TETANUS SUCCESSFULLY (317) **TREATED BY ANTITOXIN.** T. P. KILNER, *Brit. Med. Journ.*, 1916, Jan. 8, p. 46.

A SOLDIER, aged 31, was injured by shrapnel on the right leg below the knee joint. The wound suppurated badly, and amputation was being considered when trismus with profuse perspiration set in on the *ninth* day. The leg was amputated, and tetanus antitoxin administered intraspinally and subcutaneously. In all he received 46,500 units. On each occasion when serum was given the patient's condition became temporarily much worse. The relaxation of the spasm, however, was very slow and gradual, but an excellent recovery was made. A. NINIAN BRUCE.

THE TREATMENT OF TETANUS, WITH SPECIAL REFERENCE (318) **TO THE USE OF ANTITETANUS SERUM AND THE LOCAL TREATMENT OF THE WOUND.** R. G. ABERCROMBIE, *Brit. Med. Journ.*, 1916, March 4, p. 339.

THREE cases in soldiers are recorded, developing on the *tenth*, *tenth*, and *ninth* day respectively, all of which recovered with large doses of serum. The symptoms reappeared when the doses were diminished, and subsided when the large doses were repeated. A fourth case, developing on the *twelfth* day, improved markedly also but died of an intercurrent affection. The effectual daily dose is about 10,000 to 12,000 units, which may be given twice a day, mostly intravenously. A narrowing of the palpebral fissure due to a slight continuous contraction of the orbicularis is sometimes more persistent than the risus sardonicus, occurs earlier, and may be of diagnostic value.

When tetanus has declared itself, operative surgical interference with the infected surface of the wound is dangerous, and should be a matter for grave consideration; it is preferable to imitate nature's methods—namely, to promote the formation of granulation tissue, and simultaneously to reinforce the patient's production of antitoxin by the injection of large doses of antitetanic serum. A. NINIAN BRUCE.

CHRONIC RECURRENT TETANUS. ALBERT MOUCHET, *Med. Press*, (319) 1916, *n.s.* ci., Jan. 12, p. 28.

A SOLDIER, aged 23, was wounded by a fragment of shell in the left supra-spinous fossa. *Thirteen* days after the infliction of the wound it was noticed that the patient's head was tilted towards the wounded side, and that the effort to straighten it caused pain. Continuous pain with periodical exacerbations set in, and he was given 20 c.c. of anti-tetanic serum. The pain became worse, the contractures became more pronounced, and trismus supervened with cerebral excitement, restlessness, hallucinations, delirium, and insomnia. He was given large doses of chloral and morphine, and a second injection of serum (10 c.c.). Little by little the attack passed off, and he was sent to a convalescent home, although pain and stiffness in the shoulder remained.

About five weeks later he was returned to hospital with a fresh outbreak of tetanus, trismus, and contractures, especially on the left side, with delirium. He was given 10 c.c. of serum and chloral. The X-rays showed a piece of shrapnel in the subclavicular fossa. It was later removed under chloroform, and a small fragment of cloth containing a few tetanus bacilli was also found. He gradually recovered. It was considered that the relapse occurred as soon as the neutralising effect of the previous injections of serum had passed off. A. NINIAN BRUCE.

A CASE OF GENERAL TETANUS FOLLOWING LOCAL TETANIC
(320) **SPASMS OF INJURED LIMB.** THOMAS B. MOUAT, *Lancet*, 1916, Jan. 22, p. 188.

A SOLDIER, aged 40, received an extensive lacerated wound in the left upper arm on 25th September. Antitetanic serum was given subcutaneously fourteen hours later. From 13th October to 5th November, when the limb was amputated, the patient complained of painful spasms in the injured limb, which were usually excited by the dressing of the limb. Two days after amputation the twitchings recommenced in the muscles of the stump, and gradually spread to the shoulder-girdle. On 8th November the stump was opened up freely, following which the spasms spread to the shoulder-girdle muscles of the opposite side, and trismus with head retraction made it clear the condition was due to tetanus. He was given 3,000 U.S. units of anti-tetanic serum intrathecally without any benefit, but later 6,000 units intrathecally were followed by distinct improvement. The muscular spasms ceased completely about 20th November, but he died about six weeks later from a right-sided sub-diaphragmatic abscess of pyæmic origin.

About *eighteen* days thus elapsed before any symptoms developed, possibly due to the prophylactic injection delaying the onset of the symptoms, interference with the wound being apparently the cause of the general onset later.

A. NINIAN BRUCE.

A CASE OF TETANUS OCCURRING IN A SOLDIER TWO MONTHS
(321) **AFTER BEING WOUNDED.** D. PEARCE PENHALLOW, *Lancet*, 1916, Feb. 26, p. 464.

A SOLDIER, aged 25, was wounded on 11th October in the face, neck, right arm, hand, right thigh, and right lower leg, the tibia and fibula being fractured. At the time he was given 750 units of antitetanic serum. Various pieces of shell were removed, and he appeared to be making an uneventful convalescence, except for his leg, which was badly infected. On 4th December he was given ether to overcome contracture of his forearm and to correct the position of his leg. One week later he complained of pain in the masseter muscles. This increased until five days later he was unable to open his mouth fully. During the day tonic spasm of the masseter muscles set in, with clonic spasms of the diaphragm, abdominal, and back muscles. Recovery followed the subcutaneous and intravenous injection of antitetanic serum, 6,000 units in all being administered.

A. NINIAN BRUCE.

LOCAL AND LATE TETANUS AFTER PREVENTIVE INOCU-
(322) **LATION. TREATMENT BY LARGE DOSES OF SERUM. SEVERE ANAPHYLAXIS. RECOVERY.** (**Tétanos local et tardif après sérothérapie préventive. Traitement par de hautes doses de sérum. Choc anaphylactique grave. Guérison.**) P. CARNOT, *Paris méd.*, 1915, v., p. 541.

A SOLDIER was wounded in the left arm on 16th June, and received a preventive inoculation of 10 c.c. antitetanic serum. The wound did not heal well, and contracture developed. On 19th August tetanus supervened, but the spasms were almost entirely confined to the wounded limb. There were a slight nuchal rigidity, some strabismus, and cramps in the right arm and legs. Larger doses of serum were given locally, intravenously, and intraspinally. After 160 c.c. had been injected severe symptoms of anaphylaxis occurred. When the patient was discharged in October there was still a slight contracture of the affected arm.

J. D. ROLLESTON.

IODINE IN TETANUS. A. T. MacConkey and S. S. Zilva, *Brit.* (323) *Med. Journ.*, 1916, March 18, p. 411.

It is known that iodine possesses the power of rendering tetanus toxin non-toxic, and such a modification of this toxin can produce active immunity.

Iodine injected subcutaneously, however, has no effect upon tetanus toxin, which has been also injected subcutaneously in a different part. There is thus no hope of influencing favourably the course of an attack of tetanus by injections of iodine alone, nor does iodine appear to have any effect in enhancing the power of serum. It would seem that iodine can only be of use when applied to the infected focus, so that it can come into direct contact with the toxin before absorption.

A. Ninian Bruce.

GENERAL.

PARALYSIS OF THE OCULO-MOTOR NERVE AT THE ONSET (324) **OF PARATYPHOID A. (Paralysie du nerf moteur oculaire commun apparue dès le début d'une paratyphoïde A.)** G. Guillain and J. A. Barré, *Ann. de Méd.*, 1916, iii., p. 103.

A soldier, aged 26, was suddenly seized with violent headache and total paralysis of the right oculo-motor nerve (internal and external ophthalmoplegia). On examination a fortnight after the onset he showed, in addition to the paralysis, œdema and congestion of the papilla, with diminution of vision, loss of tendon reflexes in the upper and lower limbs, and fever without any objective symptoms of meningitis. The cerebro-spinal fluid was perfectly normal. A blood culture showed that the infection was paratyphoid A. Complete recovery took place at the end of a month. The paralysis was probably due to a toxic or infective neuritis similar to that met with in typhoid fever. J. D. Rolleston.

THROMBOSIS OF THE CEREBRAL ARTERIES IN PARA- (325) **TYPHOID B.** Wm. MacAdam, *Lancet*, 1916, Jan. 29, p. 243.

A corporal, aged 25, was admitted into hospital from Gallipoli in a semi-comatose condition, with all the signs and symptoms of the "typhoid state." He also showed complete right-sided hemiplegia and right facial paralysis. The limbs were limp and flaccid, with no reflexes. Babinski's sign was negative. The cerebral symptoms seemed to have been of at least six days' duration. He died in coma.

At the autopsy thrombosis of the upper end of the left internal carotid artery, extending into the middle meningeal artery and

its lenticulo-optic and lenticulo-striate branches, was found. An area of cerebral softening of a reddish-white colour, and of the size of a pigeon's egg, involved the internal capsule and lenticular nucleus.

The spleen was about four times its normal size, and a pure culture of *B. paratyphosus B* was obtained from it.

A. NINIAN BRUCE.

DIFFUSE TRAUMATIC ANEURISM OF THE FEMORAL ARTERY, WITH CEREBRAL COMPLICATIONS. JAMES HOSSACK, *Clinical Journ.*, 1916, xlv., May 3, p. 167.

(326)

A SOLDIER, aged 34 years, was admitted to hospital with a large, smooth, pulsating, but ill-defined tumour in the region of the right femoral artery. The right limb was colder than the left and slightly œdematous, and the patient complained of numbness and inability to move the limb in bed. X-rays showed a small piece of shrapnel a little below Poupart's ligament in the line of the artery. The diagnosis lay between aneurism and abscess.

Four days later he had a rigor, and developed right hemiplegia with aphasia. A cerebral embolus was diagnosed, and he was trephined. About 1 oz. of pus was evacuated from the region of Broca's area. The external iliac artery was then tied, and an abscess in a mass of partly organised blood clot was found, with the small piece of shrapnel in the centre. The patient made an excellent recovery.

A. NINIAN BRUCE.

A CASE OF SEROUS APOPLEXY FROM NEO-SALVARSAN CURED BY MILIAN'S ADRENALIN METHOD. (**Cas d'apoplexie séreuse du néo-salvarsan guérie par la méthode Milian à l'adrénaline.**) SANPHAR, *Bull. et mém. Soc. med. Hôp. de Paris*, 1915, xxxix., p. 1276.

(327)

A SOLDIER, suffering from syphilitic disease of the testis, was given two intravenous injections of neo-salvarsan, the first consisting of 15 cgm., and the second given a week later of 20 cgm. Two days after the second injection he developed headache, vomiting, raucous respiration, unconsciousness, complete muscular relaxation, and a temperature of 104° F. Complete recovery took place in twenty-four hours after one intramuscular and four subcutaneous injections of 1 mgm. adrenalin.

J. D. ROLLESTON.

A CASE OF "STATUS EPILEPTICUS," AND DEATH DUE TO
(328) **CEREBRAL CYSTS OF *CYSTICERCUS CELLULOSÆ* (LARVÆ OF *TÆNIA SOLIUM*).** G. E. PEACHELL, *Journ. Ment. Sci.*, 1916, Jan., p. 180.

A HEALTHY soldier, aged 39 years, who had served in India and South Africa, and with no previous history of a fit, was sent back to England after the battle of the Aisne, as he had developed "epilepsy." He improved, but relapsed on sick furlough, and was readmitted to a military hospital. Becoming irritable, &c., he was sent to an asylum. The seizures became numerous. The fit was rather of the Jacksonian type, and spread from the left face to the left arm and leg. The right side of the body was affected later, and only slightly. There was right conjugate deviation. He died in status epilepticus. At the post-mortem about seventy small encapsulated cysts the size of a pea were found scattered in the pia (some actually in the grey matter) over both hemispheres, and more numerously so in the right Rolandic area. All the other organs were healthy. There was no tapeworm. Dr Spilsbury reported the cysts to be examples of *Cysticercus cellulosæ*.

The author reports the case of another soldier, still alive, who became epileptic after the South African War. He had cysts on his arms, legs, and tongue. His epilepsy was increased by drink.

H. DE M. ALEXANDER.

DESERTION IN PRESENCE OF THE ENEMY IN AN EPILEPTIC
(329) **FUGUE. (Abandon de poste en presence de l'ennemi dans une fugue épileptique.)** H. VERGER, *Journ. de méd. de Bordeaux*, 1916, lxxxvii., p. 63.

A SOLDIER, aged 27, while on sentinel duty at night, laid down his gun and disappeared. Five hours later he was found in a village two kilometres from the front, where his company had been previously stationed. He was arrested and examined by Verger, who elicited the following history. His father had been in an asylum for thirteen years. He had suffered frequently from nocturnal enuresis up to the age of 14 years, and at rare intervals since up to two months ago, when it had greatly increased in frequence. There had been two previous fugues. He presented a low degree of intelligence, and was subject to intermittent outbursts of violent temper.

No convulsions had been observed by his comrades.

The diagnosis of larval epilepsy was made, and the medico-legal conclusion was "complete irresponsibility." The patient was sent to a neurological hospital, in which the occurrence of slight convulsive attacks at night were observed on several occasions.

J. D. ROLLESTON.

CONGENITAL FAMILIAL PARAMYOTONIA (EULENBURG'S DISEASE). TRANSITORY RIGIDITY OF THE MUSCLES OCCURRING UNDER THE INFLUENCE OF COLD AND DAMP. (**Paramyotonie familiale congénitale (Maladie d'Eulenbourg). Rigidité transitoire des muscles se produisant sous l'influence de froid et de l'humidité.**) A. J. RAYNEAU and A. BOUTET, *Paris méd.*, 1916, vi., p. 48.

(330)

A RECORD of a case in a soldier, aged 38. His paternal great-grandmother, grandfather, father, two or three aunts, two brothers, and two of his three children, a girl aged 10 and a boy aged 8 years, showed in different degrees the same phenomena, which was known in the family as "the hereditary cramp." The muscles affected were the flexors of the fingers, interossei, and certain muscles of the thenar eminence, as well as certain superficial facial muscles, viz., the corrugator supercilii, pyramidalis nasi, orbicularis palpebrum, and levator palpebræ, and to a less degree the orbicularis oris and zygomatici. At intervals the masseter and quadriceps cruris were affected for a very short time, and in a very slight degree.

The symptoms first appeared at the age of six to eight months. At first the muscles of the face alone were affected, but later, when the child began to make more use of his hands, the hand muscles also became involved. Electrical examination showed no change in the faradic contractility of the nerves and muscles, and the galvanic excitability of the nerves was also normal, but the galvanic excitability of the muscles showed the *incomplete myotonic reaction* described by E. Remak.

None of the muscles showed any hypertrophy. The dominating feature in all was the part played by cold in the production of the symptoms, except in the second child, in whom they appeared in the limbs without any change in the external temperature.

J. D. ROLLESTON.

SCARLATINAL NEURALGIA. (**Les nevralgies scarlatineuses.**) F. RAMOND and G. SCHULTZ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 298.

(331)

DURING the last few months these army doctors have met with this symptom in 25 per cent. of their cases. It starts in the first few days of the disease, more rarely after the tenth day, but it may recur towards the fifteenth or twentieth day. It chiefly affects the sciatic, and more rarely, in order of frequency, the cervical plexus, the trigeminal, and the intercostals. In one case all these nerves on one side were affected at once. The pain is moderate, fairly diffuse, and may be confounded with that of

articular rheumatism. No disturbance of objective sensibility or trophic changes were noted. Lumbar puncture in two cases showed slight increase in the amount of albumin in the cerebro-spinal fluid. It is therefore probably a neuralgia of the peripheral type. Its duration is fairly short, even without any treatment, and does not as a rule exceed ten to twelve days. In 15 per cent. there was a coincidence of neuralgia and rheumatism. The action of salicylates on the neuralgia is undoubted, but less marked than on articular rheumatism. Aspirin gave the best results.

J. D. ROLLESTON.

HYSTERICAL TACHYPNŒA IN A SOLDIER. (Tachypnée hystérique chez un militaire.) (332) L. GALLIARD, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1915, xxxix., p. 1295.

A RECORD of a case in a man, aged 23, simulating valvular disease of the heart. The respirations were 128, and the pulse 112 per minute. The patient presented no other stigmata, and was therefore an example of monosymptomatic hysteria, like Charcot's case, in whom the respirations ranged from 170 to 180 per minute (*cf. Review*, 1915, xiii., p. 509). J. D. ROLLESTON.

BERI-BERI, WITH SPECIAL REFERENCE TO PROPHYLAXIS AND TREATMENT. (333) WM. HENRY WILLCOX, *Lancet*, 1916, March 11, p. 553.

THIS paper is based upon a study of fifty cases of beri-beri seen during the latter half of 1915 in the Mediterranean area. Twenty-six cases were seen from the Dardanelles, and eleven from Mesopotamia. The dietetic conditions in the two series of cases previous to the onset of the disease were similar. Of the twenty-six Dardanelles cases, twenty-one had suffered from some toxic factor associated with recent jaundice, diarrhœa, paratyphoid fever, or purpura.

In the cases observed, which were almost entirely of the œdematous or wet type, the earliest symptom noticed was usually some weakness of the legs or shortness of breath on exertion, with malaise and anorexia. Paræsthesia of the legs occurred quite early in some cases, patients complaining of numbness, "pins and needles," and alteration in the tactile sense. One of the earliest evidences of weakness of the legs is shown by the "squatting test." This test consists in the patient bending his knees, and separating them while standing, so that he assumes a squatting position with the buttocks a few inches from the ground. A beri-beri patient is unable to raise himself up from this position,

and often attempts to do so by climbing up his knees with his hands, very much like a patient suffering from pseudo-hypertrophic muscular atrophy. One patient said he first noticed that something was wrong because he could not step up on the firing ledge of his trench. The gait is unsteady and high-stepping, with a tendency for the toes to drop. Two of the Dardanelles cases showed circumoral anæsthesia. Laryngeal paresis occurred in two Dardanelles and two Mesopotamia cases. Pharyngeal paresis, shown by difficulty in swallowing, occurred twice. The knee jerks may be increased in the first few days but are later lost. The knee jerk usually disappears before the Achilles jerk, and when both reflexes are lost, the Achilles jerk is recovered before the knee jerk when the patient improves.

Pyrexia is absent. Vomiting is a bad sign. Loss of weight is common.

Other types of beri-beri are (1) the acute pernicious type, (2) the dry or atrophic form, and (3) the rudimentary form. The etiology, differential diagnosis and treatment, and prophylaxis are discussed.

The causes of beri-beri, apart from "vitamines," have been stated to be:—

(1) Arsenical poisoning.
(2) Copper poisoning.
(3) Potassium oxalate poisoning.
(4) Food poisoning, raw fish containing parasites, decomposed fish, or decomposed rice.
(5) Specific coccus, the kakke coccus of Okata and Kokubo.
(6) Animal parasites, *Ankylostomum duodenale* and *Trichocephalus dispar*.
(7) Spore-bearing fungus isolated from intestine, liver, and spleen.
(8) Locality, infection being spread from the soil.
(9) Deficiency of organic phosphorus in the dietary.

In the cases of beri-beri in this series the dietetic conditions were compatible with the development of beri-beri. In the Dardanelles series the presence of a toxic factor such as jaundice, diarrhœa, or paratyphoid necessitated a special diet, which, although suitable to the diseases in question, was almost devoid of anti-beri-beri vitamine, and so an additional dietetic factor was added to a borderland case, thus causing the development of the disease.

A. NINIAN BRUCE.

Reviews

SURGERY OF THE HEAD. L. BATHE RAWLING. Pp. 150, with 31 figs.
(334) **Oxford War Primers. Henry Frowde and Hodder & Stoughton, London. 1915. Price 3s. 6d. net.**

IN the South African War, of 22,461 men injured by rifle or shrapnel bullet, 2,379 were injured in the head, a proportion of rather over 10 per cent. In all probability the present war will result in a higher ratio of head cases as compared with the rest of the body on account of the advent of trench warfare and the necessity it entails of exposing the head, neck, and upper parts of the body in proportion to other regions. For those who have thus to deal with head injuries, especially from the surgical point of view, and who wish a short and concise account of the present state of our knowledge on the subject, no better small book could be recommended than the present.

It opens with a chapter upon the clinical applied anatomy of the head, illustrated by figures which show at a glance the distribution of the different nerves, arteries, and veins. There then follow a series of chapters upon injuries of the scalp and skull, fractures of the vault, with the treatment of concussion, compression and irritation of the brain, intracranial hæmorrhages, fractures of the base, infections of the brain and meninges, and wounds of special regions, *e.g.*, mastoid, orbit, and jaws. The book concludes with a chapter upon cranio-cerebral topography and the technique of operations on the skull and brain.

The information is stated clearly and not at too great length. The question of treatment, the indications when to operate and when not to operate, and the complications liable to occur are carefully pointed out. The figures are excellent.

Like the other members of the series, the book is of a size suitable for slipping in the pocket, so that it can be used for reference at any time.

FIELD SERVICE NOTES FOR R.A.M.C., incorporating amend-
(335) **ments.** Major T. H. GOODWIN, R.A.M.C. Pp. 94. John Bale, Sons & Danielsson, Ltd., London. 1916. Pr. 3s. net.

THE greater portion of the notes included in this small reference pocket-book have been extracted from text-books and journals. Some notes, such as the methods of packing field ambulance equipment, plans for establishing a dressing station, &c., are the outcome of personal experience in a camp of instruction, while other paragraphs are only intended as suggestions or opinions, and are in no way authoritative.

The notes have been arranged as follows: The first section contains brief extracts from War Establishments in order that the composition of units, &c., may be quickly looked up. Then follows the system of evacuation of the sick and wounded from front to base, commencing with the regimental medical establishments, and passing through the various links of the chain to the hospital ships. Notes on sanitation, supplies, billeting, horse management, and map reading follow, while the concluding section deals with the outlines of mobilisation.

The book should prove useful, and slips easily into the pocket.

BED-SORES—Their prevention and cure. CATHERINE W. SMART, (336) Matron of Waddington Hospital, Yorks. Pp. 52, with 6 figs. John Bale, Sons & Danielsson, Ltd., London. 1916. Pr. 1s. net.

THIS is a small book written for the benefit of those whose duty it is to nurse the sick at home. It describes the treatment of bed-sores at different stages, and gives a number of useful little hints about the requirements of a bed, the utensils to be used, the filling and testing of a water bed, &c. It is essentially a book for nurses, to whom it should prove useful.

BOOKS AND PAMPHLETS RECEIVED.

Bing, Robert. "A Text-book of Nervous Diseases for Students and Practising Physicians." In thirty lectures. Only authorised translation, by Charles L. Allen, M.D. Pp. 481, with 3 figs. Wm. Heinemann, London. Pr. 21s. net.

Dana, C. L. "Text-book of Nervous Diseases." Eighth edition. Pp. 632, with 4 plates and 258 figs. John Wright & Sons, Bristol. 1916. Pr. 21s. net.

Falta, Wm. "The Ductless Glandular Diseases." Translated and edited by Milton K. Meyers. Second edition. Pp. 674, with 101 figs. P. Blakiston's Son & Co., Philadelphia. 1916. Pr. $7.00 net.

Goodwin, Major T. H. (R.A.M.C.). "Field Service Notes for R.A.M.C., Incorporating Amendments." Pp. 94. John Bale, Sons & Danielsson, Ltd., London. 1916. Pr. 3s. net.

M'Donagh, J. E. R. "Links in a Chain of Research on Syphilis (Oxidation and Reduction)." Pp. 206. Harrison & Sons, London. 1916. Pr. 5s. net.

Rebizzi, Renato. "Pseudo-Tumore Cerebrale." Pp. 341, with 14 figs. G. Bignotti & Figli, Castiglione-Stiviere (Mantova). 1916.

Smart, Catherine W. "Bed-Sores—Their Treatment and Cure." Pp. 52. John Bale, Sons & Danielsson, London. 1916. Pr. 1s. net.

Trotter, W. "Instincts of the Herd in Peace and War." Pp. 213. T. Fisher Unwin, London. 1916. Pr. 3s. 6d. net.

Review
of
Neurology and Psychiatry

Original Articles

FOCAL AND GENERAL UNILATERAL BRAIN ATROPHY: EFFECTS UPON THE CORPUS CALLOSUM.[1]

By A. E. TAFT, M.D.,
Curator of the Department of Neuropathology,
The Harvard Medical School, Boston.

(With Plates 2-6.)

A FAVOURABLE opportunity for pathological investigation of the human corpus callosum is afforded by cases of infantile hemiplegia. Institutions for epileptics not infrequently show marked examples, perhaps because whatever caused the hemiplegia (prenatal lesions, cortical hæmorrhagic encephalitis, perhaps poliomyelitic or the primary acute type described by Strümpell, or possibly other still more obscure causes) at the same time provoked the epilepsy.

The object of this study was to utilise epileptic material in the interest of the knowledge of the corpus callosum. This material was derived from the Monson State Hospital, and analysed anatomically and by means of photographs, with the aid of the Massachusetts State Board of Insanity. Its most striking result dealing with (*a*) two cases of relatively *complete* unilateral cerebral atrophy, and (*b*) three cases of sharply defined *focal* unilateral atrophy, is the demonstration that

(1) Complete unilateral atrophy results in a general diffuse thinning of the corpus callosum, and

[1] Read at meeting to review twenty years' work at the Monson State Hospital, Palmer, Massachusetts, May 4, 1916.

(2) Partial unilateral atrophy entails a partial thinning of the corpus callosum in a region precisely opposite to the location of the cerebral lesion. Accordingly, one may suppose that whatever the ultimate origins or terminations of the corpus callosum fibres, they run in an approximately transverse direction while within the corpus callosum. Since our knowledge of the exact location of the cells of origin and the terminal arborisations of the corpus callosum fibres is at the present time very slight, it is clear that such a study as this may finally add to our knowledge of a very important problem—the physiology of the commissural system. The results of this study incline the writer to agree with von Monakow and others, that the parts of the callosum unite symmetrical areas of the cortex, rather than with Cajal, who believes that the corpus callosum is much more complex, and unites dissimilar areas. It may be that the corpus callosum does, by means of collaterals, effectively unite dissimilar areas of the hemispheres.

Material.

In 1912 the Monson State Hospital had its collection of formolised brains photographed as a permanent record, providing a possibility for detailed study from the anthropological-morphological point of view. At that time there were fifty specimens available. Twelve photographs were made of the surfaces of each brain; six with the pial membrane intact, including top, base, two lateral surfaces, and two mesial surfaces. After removal of the pia, the photographs were duplicated. In addition to this, in twenty-five cases the brain was cut in frontal sections, one centimetre or more in thickness, according to the proportions of the brain, and the posterior surface of each of these sections was photographed. Altogether, this makes a detailed, permanent record of a series of epileptic brains which is at the disposal of any one who may wish to make an investigation of the gross morphology at any time. Later, a much more detailed piece of work has been begun, in which sections from twenty-nine areas of the cortex of twenty-five cases have been prepared for histological examination, together with sections from cerebellum, medulla, and high cord. From the entire number five specimens have been chosen for whole-brain sections. These five are those which are the subject for special consideration in this paper.

Each one of these cases presents a gross lesion mainly of one hemisphere. In detail they are as follows:—

Case Descriptions.

Case I. (11-26).—Female, 19 years of age at death; duration of epilepsy, seventeen years. Mental classification, moron. On entrance, physical examination showed complete paralysis of left arm and hand, with contraction of wrist and fingers. The left knee was bent, but could be straightened. Left knee-jerks much increased and Babinski reflex positive.

The history of the epilepsy is, that at two years there was an illness called meningitis, at which time the patient had convulsions. Previously she had been as bright as the ordinary normal child of her age. Following this there were no further epileptic manifestations until the age of 6 years, when she had the measles. During this illness there was one distinct convulsion, and later she began to have staring spells, and slight convulsions which grew progressively more severe as she grew older. On admission to the hospital, four to ten attacks were occurring daily. They were said to be preceded by tachycardia. During the hospital residence of five years, there was a continuance of convulsions, varying in frequence and severity, accompanied by progressive mental enfeeblement. Death was due to status epilepticus.

The brain weighed 1,260 gm. It showed an extreme degree of asymmetry, due to much tissue destruction on the right side, involving the greater part of the central convolutions. Of this area, only the upper portion of the post-central gyrus, and the posterior half of the para-central lobule remain at all in a normal condition. Further, there is complete destruction of the supramarginal gyrus, and a marked degeneration of the frontal operculum. This corresponds exactly with the paralysis present, and accords roughly, perhaps, with the degree of mental deterioration. The left hemisphere shows nothing remarkable in the gross. On palpation the cortex is soft and springy, suggesting a considerable degree of œdema, especially over the central convolutions.

On the mesial surface the most notable finding is the marked narrowing of the corpus callosum, for a certain definite segment of the horizontal portion, exactly corresponding to the cortical destruction in the right hemisphere; this includes the posterior

two-thirds of the callosal body. In this part the width is only 2 mm., while in the anterior third it is 5 mm. in width. This apparently represents the inter-hemispheral fibres, arising from the area of the cortex destroyed in the right hemisphere.

Case II. (09-14).—Female, 22 years of age at death; duration of epilepsy, fourteen years. Mental classification, imbecile. Physical examination at the time of entrance to the hospital showed a left hemiparesis. Patient is able to use her hand in grasping objects, but cannot execute fine movements. There was a dorso-lumbar scoliosis, and some evidence of a left-sided facial paralysis. Reflexes increased. Sensory disturbance more marked in upper than in the lower extremities. An indefinite history suggests anterior poliomyelitis in childhood. During the six years of hospital residence the convulsions varied from four to forty-five monthly.

The brain, which weighed 970 gm., is fairly developed, but extremely simple in configuration. On inspection a marked degree of atrophy of the main part of the post-central gyrus is found, involving also the entire inferior parietal lobule, and all except the most anterior marginal portion of the superior parietal lobule. Frontal section through this area shows almost complete loss of substance, the wall of the hemisphere being reduced to the thinnest possible layer of tissue. The findings apparently correspond with the clinical signs. The motor disability probably depended more directly upon the sensory disturbance, as evidenced by the post-central gyrus degeneration, than upon absolute destruction of motor fibres. The loss of cortex in the inferior parietal lobule would result in loss of muscle sense, as shown by inability to execute fine movements with the corresponding hand, while retaining the ability to use it in a general way, more or less reflex in nature, as in merely grasping objects. Cause of death, status epilepticus.

On the mesial surface one may distinguish a sharply localised area of thinning of the corpus callosum, limited to its most posterior portion, and mainly affecting a very narrow segment of the body adjoining the splenium; the latter is also somewhat thinned. Thus one may easily suppose that this narrowed portion of the corpus callosum corresponds to the fibres from the atrophic area in the right hemisphere, crossing to the opposite side.

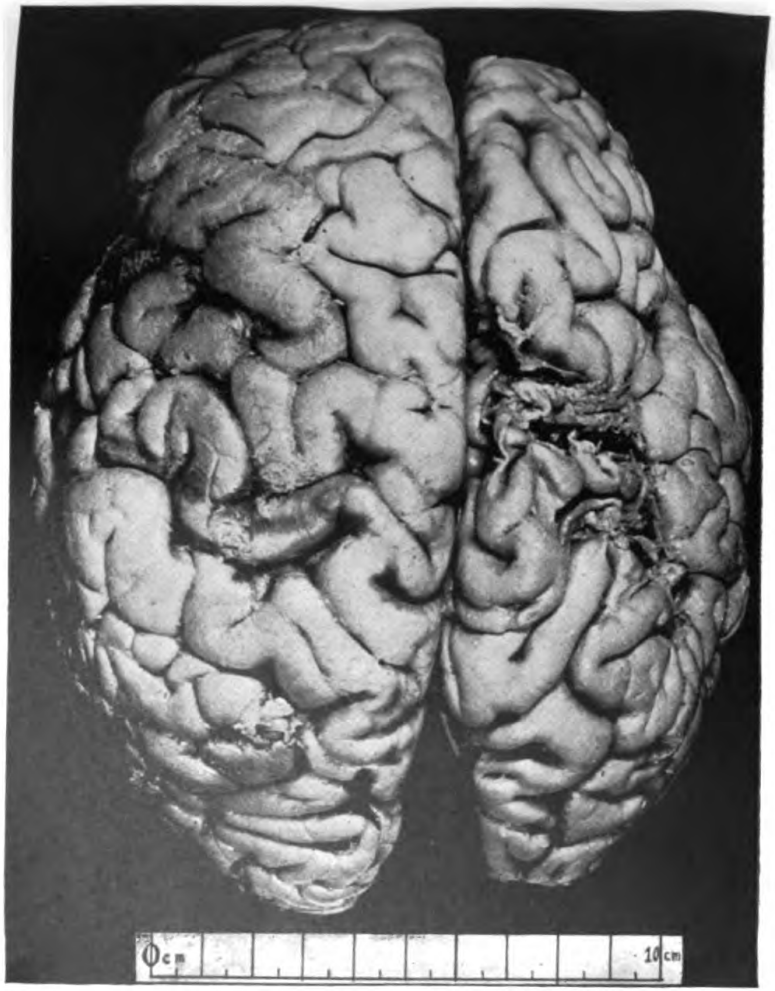


FIG. 1.—Top of Case 1, showing asymmetry due to destruction of tissue in central region.

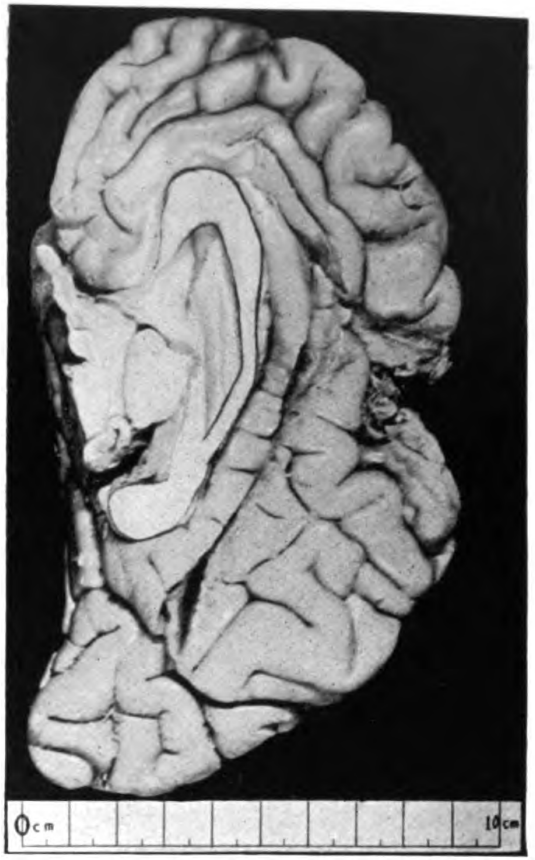


FIG. 2.—Mesial surface of Case 1, showing destruction of tissue in the region of the operculum, and the corresponding thinning of the posterior two-thirds of the body of the corpus callosum.

PLATE II.

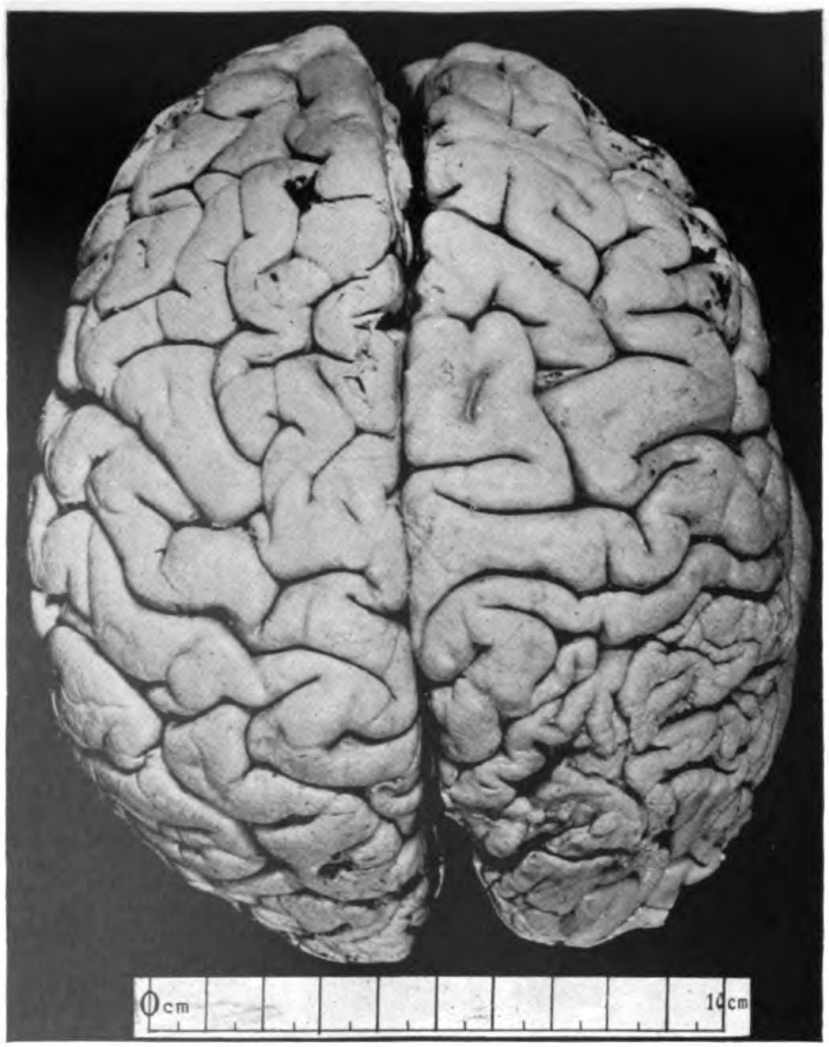


FIG. 3.—Top of Case 2, showing atrophy of the post-Rolandic region, and slight consequent asymmetry.

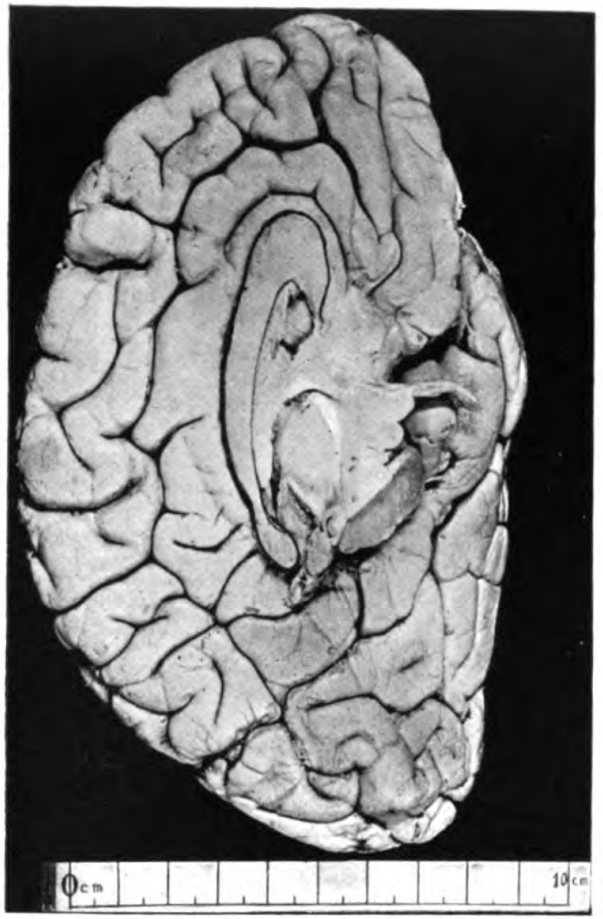


FIG. 4.—Mesial surface of Case 2, showing thinning of the corpus callosum just anterior to the splenium.

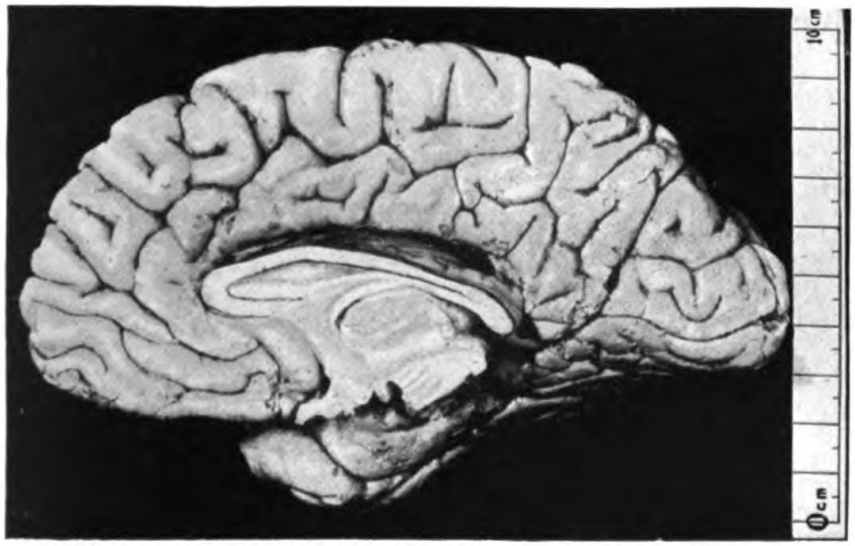


FIG. 6.—Mesial surface of Case 3, showing remarkable thinness of the entire corpus callosum, corresponding to the size of the left cerebral hemisphere.

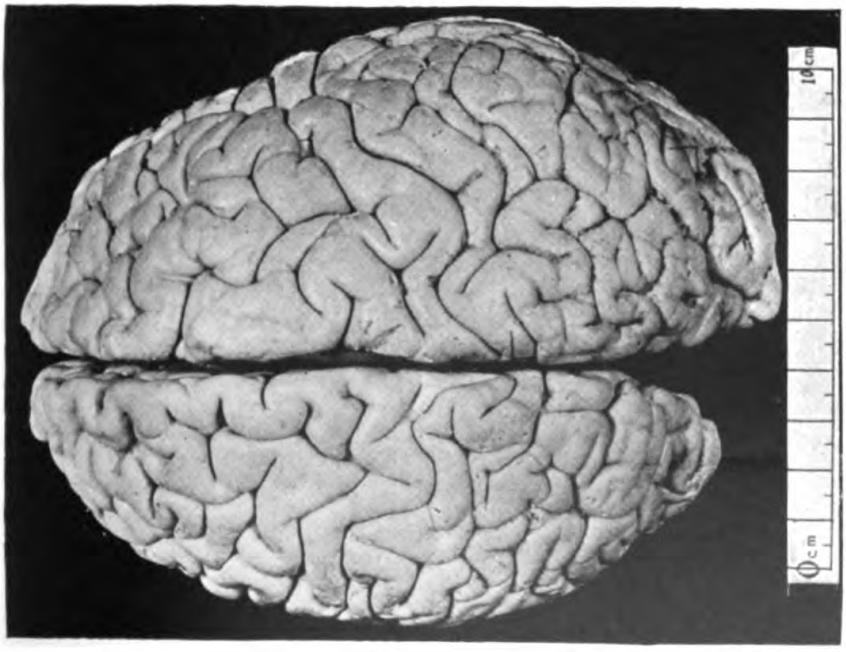


FIG. 5.—Top of Case 3, showing marked asymmetry, due to lack of development of the left hemisphere.

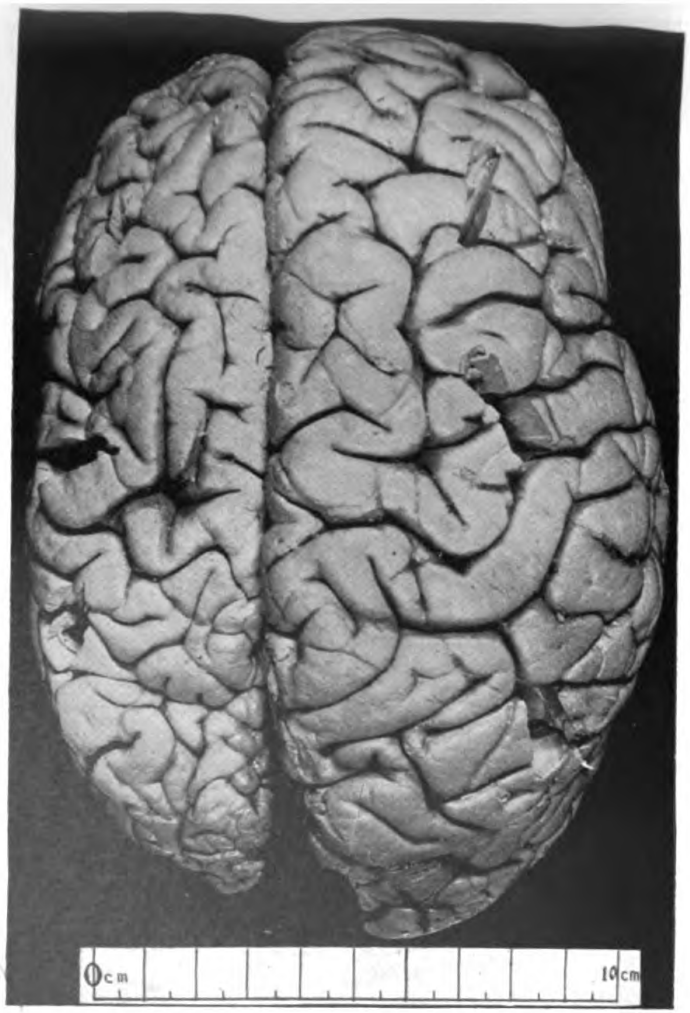


FIG. 7.—Top of Case 4, showing marked asymmetry due to lack of development and retrograde changes in the left hemisphere.

FIG. 8.—Mesial surface of Case 4, left hemisphere, showing atrophy of hemisphere, and corresponding thinness of the entire corpus callosum.

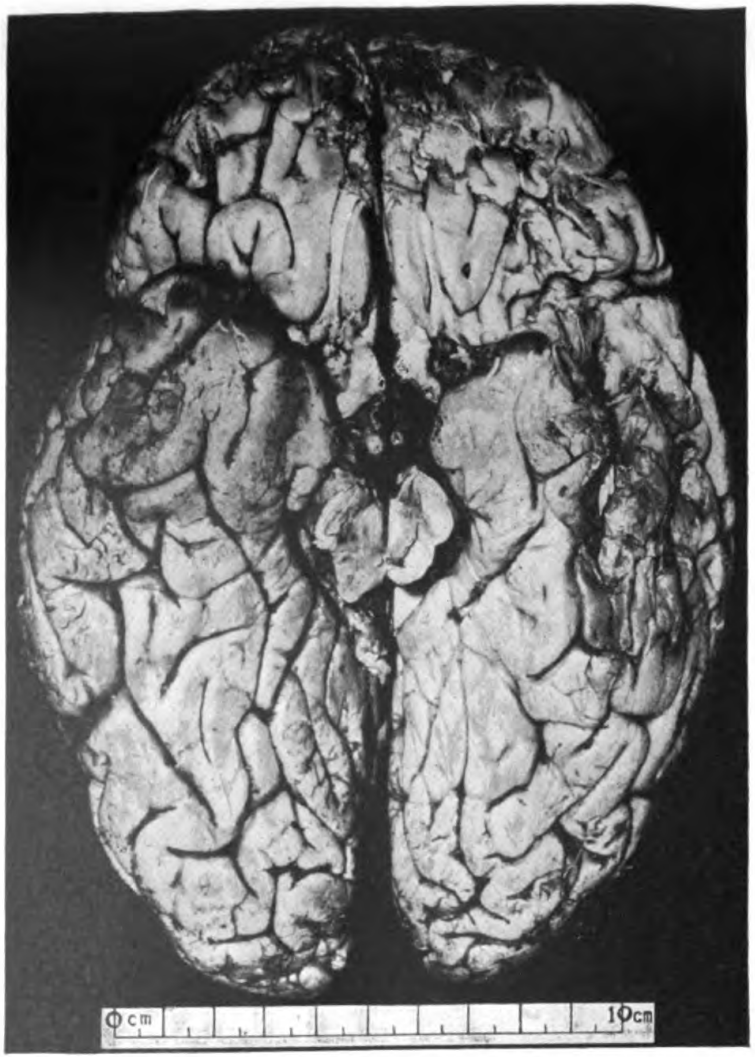


FIG. 9.—Basal surface of Case 5, showing areas of softening in the left temporal lobe, and on the left orbital surface.

FIG. 10.—Mesial surface of Case 5, left hemisphere, showing marked thinning of the middle third of the body and subgenual portion of the corpus callosum, corresponding to the softened areas in the temporal lobe and on the orbital surface.

Case III. (11-10).—Female, 18 years of age at death; duration of epilepsy, thirteen years. Mental classification, idiot. Physical examination on entrance to the hospital showed a right hemiplegia; further details are lacking, and there is no early history, as there were no known relatives nor friends, the patient having always been, as far as known, an institution inmate. Cause of death recorded as epilepsy, probably not status epilepticus.

The brain weight was 740 gm. The convolutions vary notably in width and lack a rounded contour. The pattern is rather a simple one throughout. There is marked asymmetry, due to the very small size of the left hemisphere. There is no focal tissue degeneration, but a general lack of development, affecting mainly the post-central half of the hemisphere. Corresponding to this very small hemisphere, there is also a very thin corpus callosum, and this is true of the entire structure, including knee, body, and splenium; the rostrum is least affected.

Case IV. (11-7).—Male, 30 years of age at death; duration of epilepsy, twenty-eight years. Mental classification, imbecile. On entrance to the hospital thirteen years previous to death, the physical examination showed a triplegia, involving the entire right side and the left lower extremity. The brief history states that the onset of paralysis and epilepsy was in childhood, and there was complete inability to walk. The patient was also entirely devoid of intelligence. Death was due to epilepsy.

The brain weight was 965 gm. The right hemisphere shows a fair degree of development; the convolutions are fairly broad, but not well rounded. The pattern is simple. The left hemisphere is very much smaller than the right, involving all lobes. The convolutions are narrow, increased in consistence, and on section the cortex forms merely a thin shell, the thinning being particularly marked in the temporal and post-central lobes. The corpus callosum in this case shows similar appearances to those of the preceding one, but somewhat more marked in degree, with extreme thinning in all parts, corresponding to the general cortical degeneration of the entire left hemisphere.

Case V. (09-23).—Male, 18 years old at death; duration of epilepsy, twelve years. Mental classification, imbecile. Physical examination on admission to the hospital showed partial paralysis of the right side, with some difference in the degree of development of the two sides. Muscular co-ordination is said to have been

fair; knee jerks increased. Unfortunately this brain was sectioned before the photographic work was done, so it is impossible to reproduce it, but a reconstruction from whole brain sections shows an extensive degeneration of the entire operculum, and the underlying first temporal gyrus, resulting in multilocular cyst formation, and an accompanying reduction in size of the entire left hemisphere. By the same means it is found that the corpus callosum is thinned out both in location and degree corresponding to the area of tissue destroyed in the left hemisphere.

To complete the picture of focal thinning of the corpus callosum, a case (15-63) is included which does not represent epilepsy, but criminal insanity. By the photograph it may be seen that with a great degree of softening of the cortex over the left temporal lobe and the greater part of the left orbital surface, the callosum is correspondingly thinned in the middle third of the horizontal portion, with the greatest degree in the posterior part of this area, and the rostrum also is markedly decreased in thickness.

Discussion.

The corpus callosum is made up of nerve fibres passing from one hemisphere to the other, in a transverse direction. The fibres of the posterior extremity (the splenium) are seen to connect the occipital lobes; just anterior to that, or the most posterior part of the horizontal portion, arise the parietal lobes; just anterior to this, the fibres have their origin in the temporal cortex; the middle part represents the central convolutions; the anterior portion, including the knee, pass between the convexity of the frontal lobes, and the subgenual part, or rostrum, is made up of fibres having their origin in the orbital surfaces. It has been said that this portion represents fibres only from the gyri recti, but it is plainly demonstrated by case 15-63 that this is not a fact, for here the gyrus rectus of both sides is only partly involved in the degeneration, while the remainder of the left orbital surface is very largely destroyed, with corresponding thinning of the rostrum.

Concerning the question of epilepsy in connection with these findings, it is interesting to review Strümpell's description of the development of infantile cerebral paralysis. He says that children of one and a half years and over, who previously have been both physically and mentally perfectly well, suddenly develop fever

and headache. A few hours, or oftentimes a number of days thereafter, cerebral symptoms develop in the form of convulsions, unconsciousness, or other similar phenomena. After a varying number of days the child becomes perfectly well again, except for a persistent hemiplegia, varying in extent. The clinical picture points to an affection of a focus in the cerebral cortex, suggested by the paralysis with convulsions; the former is often confined to one side, and the epilepsy persists, and may be accompanied by athetoid movements. According to Oppenheim, the extent of the encephalitic focus may vary between very wide limits; it may be so small as to be recognised only with the microscope, or, in the case of infantile encephalitis, an entire hemisphere may be involved.

The onset of the disease is very indefinite in all of the five cases in this series; only in one, 11-26, is there a history of sufficient detail to indicate any febrile disturbance. The ages at onset, however, which vary between two and eight years, suggest very strongly that a focal or general infection of the brain cortex may have been the starting-point, resulting in a corresponding degree of paralysis, and causing epilepsy. Gowers says, "Of all the regional diseases of the brain in man, lesions of the convolutions stand almost alone as a cause of convulsions." The lesions of the convolutions in the cases considered here are quite apparent, and in these, as in other specimens, may find a definite indicator in the corpus callosum, when there is sufficient involvement to include the commissural fibres.

Summary.

Five cases are considered, all of which were hemiplegic, epileptic, and mentally defective. The onset in these cases was between the second and the eighth year. Examination of the brains in every case shows a lesion of one hemisphere; focal in three cases, and involving the entire hemisphere in two. The location and extent of the cortical defect is indicated by an exactly corresponding thinness of the corpus callosum.

Literature.

Dejerine. "Anatomie des Centres Nerveux," p. 742.
Cajal. "Histol. du Système Nerveux."
Strümpell. "Archiv für Klinische Medicin." 1891, xlvii., Ueber primäre acute Encephalitis.
Oppenheim, H. "Die Encephalitis." Wien, 1907.
Gowers. "Epilepsy." 2nd ed. 1901.

Abstracts

ANATOMY.

REGENERATION IN THE BRAIN OF AMBLYSTOMA.—I. THE
(337) **FOREBRAIN.** H. SAXTON BURR, *Journ. Comp. Neurol.*, 1916, xxvi., April 15, p. 203 (4 figs.).

THE forebrain of amblystoma will not regenerate when it and its functional end organ are completely extirpated. The healing of the wound results in the formation of a curtain across the interventricular foramen derived from the ependyma lining the neural tube. If, on the other hand, the forebrain is removed without removing the end organ, the nasal placode, the presence of the latter acts as a stimulus to the regeneration of a new telencephalon through the ingrowth of the olfactory nerve. The pallial region of the telencephalon is regenerated in all cases owing to the stimulus afforded by the forward growth of axones from lower centres in the brain and cord. A. NINIAN BRUCE.

PHYSIOLOGY.

THE APPEARANCE OF THE PRESSOR SUBSTANCE IN THE
(338) **FŒTAL HYPOPHYSIS.** DEAN LEWIS, *Journ. Exp. Med.*, 1916, xxiii., May, p. 676.

THE pressor substance of the hypophysis is so marked in the pig fœtus measuring 175 mm., that it seems probable that a fœtus of this length is independent of the secretion of the mother's hypophysis. A. NINIAN BRUCE.

ON THE INOSITAL OF BRAIN AND ITS PREPARATION.
(339) GORO MOMOSE, *Biochem. Journ.*, 1916, x., March, p. 120.

A TRUSTWORTHY method for the preparation of inositol from brain, based on its solubility in dilute acetone, is described.

The inosital of human brain is identical with that of ox brain and with the ordinary *i*-inositol of plants.

A. NINIAN BRUCE.

THE GALACTOSIDES OF THE BRAIN—IV. THE CONSTITUTION
(340) **OF PHRENOSIN AND KERASIN.** OTTO ROSENHEIM, *Biochem. Journ.*, 1916, x, March, p. 142.

ACCORDING to the author, brain contains in a preformed condition mainly two representatives of the group of glucosides, namely, the galactosides phrenosin and kerasin.

The galactoside phrenosin prepared from the brain by the pyridine method is identical with Thudichum's phrenosin. The substances described by various authors as pseudo-cerebrin, cerebrin, cerebron, and *d*-cerebrin are identical with phrenosin. Phrenosin is dextrorotatory, and furnishes on hydrolysis (1) phrenosinic acid; (2) sphingosine, and (3) galactose.

Kerasin is lavorotatory, and furnishes on hydrolysis (1) lignoceric acid; (2) sphingosine, and (3) galactose.

Constitutional formulæ for the two galactosides of brain are suggested. A. NINIAN BRUCE.

PSYCHOLOGY.

THE PSYCHOLOGY OF THE TUBERCULOUS. SOLOMON BAUCH, (341) *N. Y. Med. Record*, 1915, Feb. 20, p. 310.

FIVE cases used to show that "psychic traits" in the tuberculous are a myth. Each patient may have his own peculiarities exaggerated by tuberculosis, but there is no one mental category into which they all fall. WALTER B. SWIFT.

PATHOLOGY.

BILATERAL LESION OF THE OCCIPITAL LOBES, WITH RETEN-
(342) **TION OF MACULAR AS DISTINCT FROM PANORAMIC VISION.** BYROM BRAMWELL, SHAW BOLTON, and WILLIAM ROBINSON, *Brain*, 1915, xxxviii., Dec., p. 447.

THE clinical observations on this case were made by Bramwell, and the histopathological work was done by Bolton and Robinson. The interest of the case is due to the rarity of the condition, a simultaneous lesion of the posterior part of each occipital lobe producing complete loss of peripheral vision, and to the long period of observation—over 24 years. The clinical diagnosis, made when the patient was first seen by Dr Bramwell, was verified at the post-mortem examination. During the long course of the case there was no paralysis, either motor or sensory, and although the lesion was of great extent in both occipital lobes, there was no mind blindness. The remnants of the visual fields existed mainly to the right of the fixation point, extending to about 10° at most, and resembled a modified left homonymous hemianopsia.

The histopathological examination showed a widespead disuse atrophy of the visuo-sensory cortex, excepting the more central

(calcarine) portion. The gross contraction of the fields of vision is attributed to an associative block, more complete on the left side, "sufficient to stop the passage of the feebler panoramic stimuli without interfering seriously with the macular and stronger visual stimuli." Thus the cortex of the calcarine core of the visuo-sensory area escaped the disuse atrophy. The last paragraph is here quoted—"The histological investigation of this case may thus claim not only to have explained the clinical features present during life, but to have added to our knowledge of the part played by the visuo-sensory area in macular and in non-macular or panoramic vision. It may, in fact, be stated that the anatomical basis of the former is the cortex of the calcarine core of the pear-shaped visuo-sensory area, and that the anatomical basis of the latter lies in the surrounding and remaining visuo-sensory cortex."

The article is well illustrated by excellent photographs and diagrams. It is interesting to compare the conclusions reached with those arrived at by Lister and Holmes, as a result of the examination of cases of lesion of the occipital lobes due to war injuries. Their observations indicate, though the matter is not to be regarded as completely settled, that—"The centre for macular or central vision lies in the posterior extremities of the visual areas, probably on the margins and the lateral surfaces of the occipital lobes." H. M. TRAQUAIR.

BRAIN OF MONGOLIAN IMBECILE. J. D. ROLLESTON, *Proc. Roy.* (343) *Soc. Med.*, 1916, ix. (Section for Study of Disease in Children), p. 65.

THE brain was from a female infant, aged 12 months, the youngest of eight children, who had died of severe faucial and laryngeal diphtheria complicated by broncho-pneumonia. The brain of a normal infant of the same age who had also died of faucial and laryngeal diphtheria complicated by broncho-pneumonia was exhibited to show the following features of a Mongol's brain:—

1. Reduction of the antero-posterior diameter.
2. The large and flat character of the convolutions.
3. The shallowness of the secondary sulci.
4. The deficient vascularity.
5. The small size of the pons, medulla, and cerebellum.

The brain, as a whole, was a good size for an imbecile's brain. Its weight was 836·32 gm., as compared with 816 gm., the normal weight of a female infant, aged 1 year. There was no obvious asymmetry nor any localised macroscopic lesion.

J. D. ROLLESTON.

CLINICAL NEUROLOGY.

PROPHYLAXIS OF DIPHTHERITIC PARALYSIS. (Profilassi delle
(344) **paralisi difteriche.)** E. MONDOLFO, *Il Morgagni*, 1915, lvii., Part 1, p. 409.

As the result of his experiments, Mondolfo came to the following conclusions:—

1. Injections of strychnine in guinea-pigs who had been injected with diphtheria toxin, or living and virulent diphtheria bacilli, had an obvious preventive action on diphtheritic paralysis, provided that the dose of toxin or the virus was not sufficiently strong to cause a rapidly fatal illness.

2. When, in spite of strychnine treatment, paralysis occurred, it assumed as a rule the character of a limited and curable monoplegia, instead of the ordinary type of acute ascending paralysis.

3. The general course of the disease seemed to be favourably influenced by the strychnine treatment, and in most of the fatal cases the guinea-pigs treated with strychnine lived longer than the controls.

4. The preventive action of strychnine on paralysis was shown even when it was given on the third day after the intoxication, but in such cases the drug did not appear to exercise any favourable influence on the general course and issue of the disease.

Mondolfo recommends that, in addition to serotherapy, a similar treatment should be adopted in human diphtheria. During the early stage of the disease, and for at least twenty days, adults should be given a daily injection of 4 to 5 mg. of strychnine, and children a daily injection of 1 to 2 mg.

J. D. ROLLESTON.

AN INQUIRY INTO THE CAUSATION OF SPINA BIFIDA.
(345) JAMES PERCY GOOD, *Studies in Anatomy from the Anatomical Department of the University of Birmingham*, 1916, pp. 129-180.

THE material of this investigation consisted of ten human fœtuses, at or nearly at full time, and one fœtal ferret 8 mm. long.

The conditions found in the specimens suggested that the causation was associated with an arrest of development of an ante-natal pathological nature, and supported the view of Lebedeff (1881) that a mechanical cause was responsible for the condition. The greater number of the fœtuses presented more or less pronounced spinal curvatures, which appeared to be the direct result of interference with the segmentation of the primitive vertebræ, *i.e.*, a disturbance in the development of the mesodermal tissues. The same mechanical cause which produces the flexures

also probably prevents the neural plate becoming converted into a neural tube. There was no evidence to show what was the nature of this mechanical agent. A pathological condition simulating a lymphangioma was found in most of the cases, and was probably a result of the action of the mechanical agent. The changes indicate that there is hindrance in the proper development of the membrana reuniens, and therefore a failure in the formation of the spinal meninges. As the membrana reuniens originates in the primitive vertebræ, it is most probable that the disturbing cause must have set in at a time when the medullary groove was still open, *i.e.*, before the middle of the third week.

None of the cases gave any support to the theory of a previously existing hydromyelia nor to an intra-vertebral dropsy. The mechanical cause was not adhesions of the amnion, as spinal bifida may be produced just as frequently in embryos without an amnion as in those with one. The local changes in the tissues are dependent on the original cause, and in no way secondary to the general or local interference with the development of the nervous system. A. NINIAN BRUCE.

EXAGGERATION OF THE REFLEXES IN POLYNEURITIS.

(346) (**Exagero dos reflexos nas polynevrites.**) R. T. MENDES, *Arch. Brasil. de med.*, 1916, vi., p. 72.

A RECORD of a case in an alcoholic and syphilitic woman, aged 23, suffering from pneumonia. The plantar and abdominal reflexes were absent, but the knee and ankle jerks were exaggerated. Gombault's work on peri-axile segmentary neuritis explains the condition. J. D. ROLLESTON.

INTERMITTENT HICCOUGH AND PLANTAR HYPERÆSTHESIA

(347) (**LARVAL MALARIA**). (**Soluço e hyperæsthesia plantar intermittentes (Paludismo larvado).**) A. A. DA MATTA, *Arch. Brasil. de med.*, 1916, vi., p. 76.

A RECORD of a case in a man, aged 39, cured in a few days by injections of quinine. J. D. ROLLESTON.

NERVOUS AFFECTIONS FOLLOWING MALARIA. (**Afecciones**

(348) **nerviosas consecutivas al paludismo.**) G. R. LAFORA, *Il Siglo méd.*, 1916, lxiii., p. 99.

NERVOUS complications in malaria are relatively frequent in Spain. Lafora records a case of meningo-encephalitis with a cerebellar syndrome in a man, aged 34, which was rapidly improved by lumbar puncture and intravenous injections of quinine.

J. D. ROLLESTON.

OBSERVATIONS ON ELEVEN CASES OF CEREBRO-SPINAL
(349) **MENINGITIS.** E. C. WILLIAMS, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 8.

A RECORD of cases which occurred in the Bristol epidemic during the last quarter of 1914 and the first six months of 1915. The patients' ages ranged from 9 months to 11 years. Seven recovered; four died. Only four cases showed a definite rash. Irido-cyclitis occurred in two cases. No convalescent was discharged until two cultures from the naso-pharynx had proved negative.

J. D. ROLLESTON.

THE EFFICACY OF ANTI-MENINGOCCAL SERUM IN THE
(350) **PRESENT EPIDEMIC OF CEREBRO-SPINAL MENINGITIS.** A. NETTER, *Brit. Journ. Child. Dis.*, 1915, xii., p. 353.

UP to June 1915 Netter had treated 226 cases of cerebro-spinal meningitis with serum—a larger number than that treated by any single observer. The disease was remarkably frequent in 1915, in the first six months of which forty-five of his cases had occurred, and was more severe than in previous years. Netter's results from serum treatment were as satisfactory in 1915 as in previous years, as was shown not only by the reduction of the mortality, but also by the attenuation of the disease and the diminished frequency of complications and sequelæ. The serum must be injected in large doses, and the injections repeated for several days in succession, for three consecutive days at least, and more if the fluid still contains meningococci. The earlier the treatment is begun, the more successful it is likely to be. A polyvalent serum to act on meningococci and parameningococci simultaneously should be used from the first. J. D. ROLLESTON.

PNEUMOCOCCAL AND MENINGOCOCCAL MENINGITIS AFTER
(351) **FRACTURE OF THE BASE OF THE SKULL. (Pneumokokken- und Meningokokken-Meningitis nach Schädelbasisfraktur.)** P. SCHMIDT, *Deutsch. med. Woch.*, 1916, xlii., p. 124.

A MAN, aged 19, who had been suffering some weeks from an obstinate cold, fell down stairs and fractured his base. Meningitis rapidly developed, and death took place on the eighth day after the accident. Examination of the cerebro-spinal fluid showed pneumococci and meningococci in almost equal amounts. The necropsy showed fracture of the sphenoid and ethmoid, extensive lepto-meningitis, especially in the region of the cerebellum and pons, and broncho-pneumonic areas of about three to four days' duration in both lower lobes. Infection of the meninges had

occurred by direct propagation from the inflamed nasal fossæ through the fractured sphenoid or ethmoid.

Examination of the blood showed pneumococci only, which were probably derived from the broncho-pneumonic areas.

J. D. ROLLESTON.

THE CURE OF SUPPURATIVE MENINGOCOCCAL IRIDO-
(352) **CHOROIDITIS BY INJECTION OF ANTI-MENINGOCOCCAL SERUM INTO THE VITREOUS.** A. NETTER, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 13.

THE prognosis of meningococcal irido-choroiditis is usually very unfavourable. Within four or five days it almost invariably ends in suppuration and atrophy of the eye, with loss of vision. Anti-meningococcal serum has probably reduced the frequency of this complication, but has not diminished its gravity.

Netter records two cases in a girl, aged 6 years, and in a boy, aged 2½ years, respectively, successfully treated by injections of Dopter's serum into the vitreous.

The operation had not been previously performed.

J. D. ROLLESTON.

SYPHILIS. HYPERTROPHIC CERVICAL PACHYMENINGITIS.
(353) (**Syfilis. Pachymeningitis cervicalis hypertrophica.**) C. RASCH, *Hospitalstidende*, 1915, lviii., p. 1223.

THE patient was a woman, aged 37, who had contracted syphilis eighteen years ago. Four years previously she had been treated for ulceration of the hard palate. After it had healed she developed diplopia. In the course of the next three years she had pains and paræsthesia in the shoulders and upper arms, followed by progressive loss of power in the hands and arms, and later by paralysis of both lower limbs, decubitus, and incontinence of urine. There was also marked atrophy of the small muscles of the hand, and of several muscle groups in the arms with some contracture. Wassermann positive in the spinal fluid, negative in the blood.

Considerable improvement took place under treatment with salvarsan and mercurial inunction. J. D. ROLLESTON.

ON SEVERE OPTIC NEURITIS WITH CEREBELLAR ATAXIA
(354) **IN PERTUSSIS, ENDING IN RECOVERY (PERTUSSIS ENCEPHALITIS).** (**Über heilbare schwere Neuritis optica verbunden mit cerebellarer Ataxie beim Keuchhusten (Keuchhusten-Encephalitis).**) A. STRÜMPELL, *Deutsch. Zeitschr. f. Nervenheilk.*, 1915, liii., p. 321.

A BOY, aged 4½ years, developed a typical attack of whooping cough in the middle of July. On 12th August he complained of

his eyes, and on the 13th became quite blind, and was unable to stand. The symptoms did not follow an attack of coughing, and at the time the paroxysms had already begun to diminish in severity. Ophthalmoscopic examination showed a marked degree of choked disc, such as is only seen in tumour or hydrocephalus internus. The cerebro-spinal fluid was clear, and showed no increase of cells. Recovery from the ataxia occurred more rapidly than restoration of vision, and the child was able to walk fairly well in three or four weeks. By 23rd October the optic neuritis had quite disappeared. Strümpell attributes the condition to encephalitis due to the entrance of the causal agent of pertussis into the brain (*v. Review*, 1912, x., p. 337). J. D. ROLLESTON.

UNILATERAL HYDROCEPHALUS. E. L. HUNT, *Med. Record*, 1916, (355) **lxxxix.**, p. 60.

WOMAN, aged 78. For some weeks before death she had suffered from severe headache, loss of consciousness, and general convulsions. The autopsy showed hydrocephalus limited to the left lateral ventricle, cerebral arterio-sclerosis, subdural hæmorrhage, œdema of the brain, atheroma of the aorta, parenchymatous degeneration of the liver, and chronic nephritis. No microscopical examination was made. The etiology of the condition could not be traced.

J. D. ROLLESTON.

SOME NEW SYMPTOMS IN AMAUROTIC FAMILY IDIOCY. (356) ISADOR H. CORIAT, *Boston Med. and Surg. Journ.*, 1915, July 1, p. 20.

EMPHASISES the importance of following new symptoms. *Explosive laughter*: found in three cases, cause indefinite. *Hydrocephalus*: found in one case and three previously reported. *Bulbar symptoms*: a case died from it. *Nystagmus, Hypotonia, Abnormal reflex phenomena*: acute sound sensitiveness. Same to light and tactile. Stimuli claimed to be as yet undescribed. Several reflexes mentioned showing abnormal forms (seven references, mostly a review of recent findings). WALTER B. SWIFT.

HYPOGLYCÆMIA AND PROGRESSIVE MUSCULAR DYSTROPHY. (357) R. H. MCCRUDDEN and C. S. SARGENT, *Archives Int. Med.*, 1916, **xvii.**, April, p. 465.

IN a case of progressive muscular dystrophy, the creatinin excretion was normal; large amounts of creatin were found in the urine; the ammonia excretion was low; the cholesterin content of the blood was low. A relationship between sugar content of the

blood, and ingestion of food, suggested the possibility of a decreased power to store glycogen. Treatment which increased the glucose and cholesterin content in the blood led to improvement in the clinical condition. A. NINIAN BRUCE.

PROGRESSIVE LIPODYSTROPHY. CHARLES HERRMAN, *Archives* (358) *Int. Med.*, 1916, xvii., April, p. 516.

A CASE is recorded in a woman, aged 32, Jewess, who showed emaciation of the upper part of the body, and marked increase of adipose tissue from the crests of the ilia downwards, most distinct in the gluteal region, and on the outer side of the thighs. The condition began insidiously, and was first noticed about the age of six years. The disease in no way affects the general health. Human fat and mutton suet have been injected into the hollows of the face, but after a time is absorbed. The author proposes to employ paraffin injections. About fifteen cases of this condition have been reported, all occurring in women.

A. NINIAN BRUCE.

SOME PARALYTIC CONDITIONS RESULTING FROM SURGICAL
(359) **AND OBSTETRICAL ACCIDENTS.** JAMES WARREN SEVER, *Boston Med. and Surg. Journ.*, 1915, July 1, pp. 9-12.

A RESUMÉ of paralyses. Volkmann's ischemic. Paralysis outlined. After-treatment consists in palmer and dorsal-splint, electricity, massage, and manipulation. Musculo-spiral paralysis occurs with fracture in middle third of humerus. Sensory involvement is no indication of severity. No improvement or increasing paralysis indicates surgery. After-treatment is baking, massage, electricity, and motion.

Birth palsy: causes reviewed. Signs in brief. Pupil irregularity indicates inner cord injury. Treatment in general is exercise, massage, good position. (Three references.)

WALTER B. SWIFT.

INFANTILE SPINAL PARALYSIS AND HEMIPLEGIA FROM
(360) **CEREBRAL EMBOLISM. (Paralisis espinal infantil y hemiplejia por embolia cerebral.)** E. F. SANZ, *El Siglo méd.*, 1916, lxiii., p. 34.

A WOMAN, aged 38, who had had acute poliomyelitis at 3 years of age, resulting in paralysis and deformity of both lower limbs, was suddenly seized with left hemiplegia and aphasia. Examination showed the presence of mitral stenosis. The aphasia cleared up rapidly, but facial paralysis and difficulty in movement of the left arm persisted.

Sanz suggests that the cardiac lesion was due to acute poliomyelitis as there was no history of any other infection or any other apparent cause for the hemiplegia.

J. D. ROLLESTON.

(361) **CASE OF INTRACRANIAL HÆMORRHAGE WITHOUT SYMPTOMS OF COMPRESSION.** P. W. LAM and E. LAW, *Lancet*, 1916, Feb. 12, p. 350.

A MAN, aged 32, was thrown off his bicycle owing to a collision with a cart, and taken to hospital unconscious. He was restless during the first four days, but could always be roused. No spasms were ever noticed, and no signs of paralysis developed. He died on the tenth day.

At the autopsy a very fine fissure was discovered in the right parietal bone, continued into the squamous and greater wing of the sphenoid, and measuring about 4½ inches. An extra-dural clot, measuring 2½ by 2 inches, was found corresponding to the temporal lobe of the brain, but causing no flattening of the brain itself. The surface of the brain was congested and œdematous, but the interior showed no changes.

A. NINIAN BRUCE.

(362) **TUMOUR OF THE CENTRUM OVALE OF THE RIGHT PREFRONTAL LOBE. (Tumore del centro ovale del lobo prefrontale destro.)** F. GIANNULI, *Riv. de Patol. nerv. e ment.*, 1916, xxi., p. 195.

THE patient was a woman, aged 50, in whom the diagnosis of general paralysis was at first made, but later the onset of spastic monoparesis, and Jacksonian attacks, as well as headache and nystagmiform movements of the eyes, suggested the presence of a tumour. The autopsy showed a gummatous infiltration of the centrum ovale of the right prefrontal lobe and of the dorsal half of the left ascending frontal and parietal convolutions. Giannuli's conclusions are as follows:—

1. The symptomatology of tumour of the centrum ovale of the right prefrontal lobe is predominantly psychopathic.

2. The psychopathic syndrome develops early, and long before the general phenomena of the endocranial tumour.

3. The psychopathic symptoms are of two kinds: specific symptoms due to the situation of the tumour and general symptoms of endocranial tumour.

4. The specific symptoms are divided into (*a*) fundamental symptoms, (*b*) correlated symptoms. (*a*) The fundamental symptom is defect of static memory and fixation; (*b*) the correlated symptoms are dissociation in space and time, the *moria* of Jastrowitz, and falsification of memory.

5. The general symptoms of endocranial tumour are intellectual sluggishness and intercurrent states of drowsiness.

6. The predominant function of the centrum ovale is one of anatomical and psychical association which presides over static memory and fixation. J. D. ROLLESTON.

SARCOMA OF THE DURA MATER. S. B. PAL, *Indian Med. Gaz.*, (363) 1916, li., April, p. 139.

A MALE Chinese patient, aged about 50 years, was found in a state of mental stupor. About one inch above the left ear was a large elevation of the scalp, which on palpation felt like a cyst. Next morning he was better, could walk about, but appeared to have complete loss of memory. "It seemed as if the power of the brain of receiving impressions from without was in abeyance, and its higher reflex functions were suspended." He died ten days later.

At the autopsy, although no motor symptoms were present during life, a round-celled sarcoma was found arising from the dura mater, and destroying an area of the front part of the parietal bone and a portion of its squamous portion of the temporal bone of the skull, about 4½ by 3½ in., and making a depression about 1 in. deep involving the first and second temporal, ascending frontal, and ascending parietal convolutions.

A. NINIAN BRUCE.

CONGENITAL WORD AND LETTER BLINDNESS. T. R. WHIPHAM, (364) *Brit. Journ. Child. Dis.*, 1916, xiii., p. 33.

THIS condition is probably commoner than would appear from the literature. Only sixty-four cases have been recorded, forty-seven of which were males, and only seventeen females. It is sometimes found in more than one member of a family, and as many as six cases in one family have been observed.

Whipham's case was a girl, aged 8 years. She could not say the alphabet, but could write perfectly on rare occasions, although generally she stopped at E or F, and then went wrong. She could not write a given letter, except occasionally A. Her acquaintance with figures was limited. She could not read easy words like *is* either from print or writing. She could write her own name, and the name of her school correctly, but not her first or last name separately. She could copy correctly anything written or printed.

There was no word deafness. Her sight was good, and there was no hemianopia. There was no nystagmus nor intention tremor, and the reflexes were normal. The Wassermann reaction was positive.

Whipham thinks that the lesion, possibly of syphilitic origin, was situated around the posterior extremity of the left fissure of Sylvius. He cannot explain why the corresponding areas on the right side did not take on the function of the impaired centres.

The prognosis in these cases is not hopeless. Even severe cases are capable of considerable improvement with systematic and sympathetic training. J. D. ROLLESTON.

A FURTHER CONTRIBUTION TO THE STUDY OF APHASIA
(365) **APROPOS OF A CASE OF VERBAL AMNESIA AND ALEXIA.** ALFRED GORDON, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 649.

THE case of a man, 44 years old, who, following an apoplectiform attack, became unable to recall the names of objects and the proper words for correct expression of his thoughts. In addition, he was unable to read. He possessed full understanding of spoken sentences and of objects. The imitative speech faculty was preserved.

At autopsy a large, soft, vascular tumour was seen in the left hemisphere involving the supramarginal gyrus, angular gyrus, the posterior thirds of the first and second temporal lobes, and a very small portion of the occipital lobe. The insula was intact, except its very posterior border which touched the tumour. The lenticular zone of Marie appeared to be intact. The tumour was gliomatous in character. In connection with this case the views of Wernicke on transcortical aphasia, and Marie's conception of aphasia, are discussed.

"Neither Broca, nor Wernicke, nor Marie have solved the question of localisation of aphasia, for the anatomical material in our possession tends to invalidate equally strongly the former as well as the late views on this problem. No final conclusions can be drawn in the state of our present knowledge."

D. K. HENDERSON.

HUGHLINGS JACKSON ON APHASIA AND KINDRED AFFEC-
(366) **TIONS OF SPEECH.** HENRY HEAD, *Brain*, 1915, xxxviii., p. 1.
REPRINT OF SOME OF HUGHLINGS JACKSON'S PAPERS ON
(367) **AFFECTIONS OF SPEECH.** *Ibid*, p. 28.
CHRONOLOGICAL LIST OF HUGHLINGS JACKSON'S PAPERS
(368) **BEARING ON AFFECTIONS OF SPEECH.** *Ibid*, p. 187.

THIS number is devoted to Hughlings Jackson's views of aphasia and other allied affections of speech.

In 1868 Hughlings Jackson pointed out that patients with aphasia could be divided into two groups—(*a*) those in which

the patient was almost speechless, or, at any rate, speech was gravely damaged, and (*b*) those who have "plentiful words," but habitually use them wrongly.

The loss of power to carry out an order depends on the complexity of the task. The more abstract the conception the more likely is the patient to fail to execute it, although he may succeed when it is put before him in a simpler and more descriptive form. Thus the patient who could not find the word "kitten" called it a "little fur-child," and one who could not draw a square when asked to do so drew a perfect square when told to draw a "block of wood." Because a man cannot write the alphabet we must not assume he cannot write a letter.

The higher and voluntary aspects of speech tend to suffer more than the lower or more automatic. The least voluntary speech is that which is emitted under the effect of emotion, such as exclamations, oaths, and words like "good-bye." The "speechless man is not wordless," and the apparent inconsequence of observations on persons with aphasia is to a large extent removed by an analysis of the conceptual value of the words and phrases which are actually uttered.

Writing is affected, not as a separate "faculty," but as a part of the failure to propositionise in words. There is no such condition as pure "agraphia." A man who cannot write spontaneously may be able to copy printed matter in perfect handwriting. The "faculty" of relating handwriting to print is intact; he cannot write voluntarily because he has lost the use of written words in propositions. Hence he can usually write his name and address, because in most of us this has reached with time more nearly the level of an automatic act.

Patients with such affections of speech may not be able to read aloud or to themselves when asked to do so; but they can understand what is read to them, and may even obey written commands, although unable to reproduce them in words. This is not due to some loss of function called "alexia," but to an inability to reproduce a proposition which, on the other hand, they may be capable of receiving accurately.

"Imperception" (agnosia) is on the receptive side what aphasia is in the "word series." In many cases the two conditions are combined; but they may exist separately, and where aphasia is present without "imperception," images remain intact. Thus the patient may be able to point to colours and objects when they are named; he continues able to play cards and dominoes, he recognises handwriting, although he cannot read the words written; he knows poetry from prose by the different endings of the lines on the right of the page. Thus affections of speech are caused (*a*) on

the emissive side by inability to form or to express a proposition in words, (*b*) on the receptive side by failure of those mental processes which underlie perpetual recognition.

External and internal speech are identical, except that the one leads to the utterance of articulated words, while the condition of internal speech can be discovered by writing only.

Behind external and internal speech stands the proposition which, when verbalised, can be expressed in speech or writing. This proposition is necessary for clear and logical thought, but not for all thinking. When this aspect of speech is affected the patient cannot retain a sequence of abstract propositions, because he is unable to formulate them at will to himself. He can think, but he is "lame in thinking."

If, however, "imperfection" be added to such defect of speech, the patient will not suffer from "inferior speech," but will show signs of "inferior comprehension."

In the majority of cases of affections of speech mental images are unaffected. This extremely important contribution to the theory of aphasia has been entirely neglected by neurologists, for almost every hypothesis propounded in the last forty years presupposes some defect in "auditory" or "visual word" images.

A. NINIAN BRUCE.

(369) **THE OPHTHALMOLOGICAL OBSERVATIONS OF HUGHLINGS JACKSON AND THEIR BEARING ON NERVOUS AND OTHER DISEASES.** JAMES TAYLOR, *Brain*, 1915, xxxviii., Dec., p. 391; *Proc. Roy. Soc. Med.*, 1915, ix., Nov. (Neurol. Sect.). p. 1.

HUGHLINGS JACKSON was a neurologist who, the writer tells us, considered it the luckiest thing in his medical life that he began the scientific study of his profession at an ophthalmic hospital. He was one of the pioneers of medical ophthalmoscopy, and his ophthalmological work was concerned, for the most part, with the changes seen by the ophthalmoscope in medical cases, especially in disease of the nervous system, and he constantly urged the necessity of thorough examination of the eyes in such diseases. A large field is covered by his writings on matters relating to the eye. Optic neuritis, epilepsy, paralysis of ocular muscles and nerves, and the psychological aspect of the processes concerned in and depending on the visual act, as well as other matters of interest both to physicians and ophthalmic surgeons, formed the subjects of numerous papers which contain much that is of value even after the lapse of over a generation.

Taylor has succeeded in presenting a most interesting and readable account of one aspect of the work of a great personality in modern medicine.

H. M. TRAQUAIR.

NERVOUS AND OTHER MEDICAL DISORDERS SEEN AT AN EYE HOSPITAL. (Harveian Lecture.) JAMES TAYLOR, *Lancet*, 1916, March 25, p. 657.

(370)

A DESCRIPTION and analysis of cases seen at the Moorfields Eye Hospital.

Optic Atrophy.—Out of 23 cases seen during the last five years 20 proved to be either tabes or general paralysis. Ataxy was rarely found in tabes with optic atrophy, being only present in 2 of the above cases. Very few cases with optic atrophy and signs indicative of disseminated sclerosis were seen, probably because motor symptoms usually precede eye symptoms in this condition. Optic atrophy with evidence of a chiasma lesion were not uncommon. Even in tumour cases in this region optic atrophy is the rule and optic neuritis the exception. Optic atrophy from toxic causes, usually tobacco, often with alcohol, is usually recovered from, but recovery may be incomplete but not progressive. Two, or perhaps three, cases of hereditary optic atrophy were seen. This condition is often preceded by neuritis, and may be extraordinarily rapid in development.

Defect in Ocular Movements.—62 cases of ocular paralysis were seen, mostly of the third nerve and syphilitic in origin. It may, however, be associated with migraine ophthalmoplégique. This is usually recurrent, and the recovery from the paralysis is less and less complete with each attack, until finally the paralysis becomes complete and the headaches usually cease. In two cases examined post-mortem a local condition affecting the nerve was found. Visual phenomena are usually absent in these cases.

Sixth nerve paralysis from exposure to cold is doubtful. It is usually an early sign of tabes, syphilis, or disseminated sclerosis. It was never seen associated with facial paralysis from exposure. If seen in alcoholic poisoning it may cause nystagmoid jerkings, the result of neuritis of the sixth nerve, and may result in actual sixth paralysis. Involvement of the third nerve in alcoholic neuritis indicates profound poisoning and danger of sudden death.

Myasthenia Gravis.—13 cases were seen. The great variability in the muscular weakness, especially easily seen in the eye muscles, is most striking. Double ptosis and almost complete paralysis of all ocular movements may disappear in a few hours.

Albuminuric and Glycosuric Retinitis.—47 cases of the former and 15 of the latter were seen. Albuminuric retinitis usually means death in a year in a young patient; in old people it is not so fatal.

Graves's Disease.—31 cases were seen, 4 being men. Diplopia is probably more frequent than is usually recognised. Optic atrophy was found once, probably a coincidence.

Hemiopia.—22 cases of homonymous hemianopia were seen In 13 the defect was left-sided. In 13 no cause could be discovered for the condition.

Retinal Embolism and Thrombosis.—26 cases were seen. The condition was embolic in 5, arterial in 7, and venous in 13.

Optic Neuritis.—38 cases were seen. One occurred in a girl, aged 6, and followed measles. It resulted in blindness without other symptoms. In another case it followed measles at the age of 8, resulted in blindness, improved again, and recurred after marriage. Another case, in a girl aged 11, followed chicken-pox.

A NINIAN BRUCE.

CASE OF DYSPITUITARISM IN A GIRL AGED 15 YEARS.

(371) SYDNEY STEPHENSON, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 141.

THE diagnosis of dyspituitarism was based on the following facts:—

1. The existence of bilateral simple optic atrophy, otherwise unexplained.
2. Loss of the temporal field in the left eye.
3. X-ray evidence of enlargement of the *sella turcica.*
4. The general appearance of the girl. She was inclined to obesity, had not began to menstruate, and had no pubic hair.

Large doses of thyroid had been ineffectual, and surgical intervention seemed indicated owing to the risk of impending blindness. J. D. ROLLESTON.

OBESITY; EPILEPTIFORM ATTACKS; RECURRENT JAUNDICE IN A GIRL AGED 13 YEARS.

(372) E. G. FEARNSIDES, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 37.

FEARNSIDES is unable to explain the association of these phenomena. The distribution of the obesity resembled that of normal girls, rather than that seen in hypernephroma or in dystrophia adiposo-genitalis due to sub-pituitarism, and secondary sexual characters in the brain and breasts were present, and menstruation, though irregular, occurred periodically. No evidence of pituitary involvement could be seen.

The weight was 12 st. 11 lbs., the blood pressure was 125 mm., and the urine was normal. J. D. ROLLESTON.

BLOOD CHANGES IN EXOPHTHALMIC GOITRE. (Untersuchungen über die Blutveränderungen bei Morbus Basedowii.)

(373) H. A. SÖLLING, *Nord. Med. Arkiv.*, 1916, xlix. (Kirurgi, Afd. I., h. 1-3), Nr. 7, pp. 1-44.

IN exophthalmic goitre the number of red corpuscles and white corpuscles is normal, but a differential count shows a percentage

of lymphocytes somewhat higher than normal. In completely cured cases the condition returns to normal. The blood changes are of no fundamental assistance in diagnosis, and still less in prognosis. No support is given to any of the theories for the resection of the thymus. A. NINIAN BRUCE.

NEURITIS IN PREGNANCY. F. B. McCARTY, *Amer. Journ. Obst.*, (374) 1916, lxxiii., p. 294.

LOCAL or multiple neuritis may occur early or late in gestation or during the puerperium. Multiple neuritis is more serious and usually occurs before delivery, and local neuritis after delivery. Such neuritis may show none of the causes usually associated with neuritis in the non-pregnant individual. It resembles the neuritis and paralysis often found in pelvic or genito-urinary diseases. The prognosis is favourable, though the condition may persist until after delivery.

McCarty records a case of right facial paralysis of five weeks' duration, in a woman aged 27, occurring at the time of the first conception. J. D. ROLLESTON.

THE MECHANISM OF HYSTERICAL PHENOMENA: SKETCH
(375) **OF A PSYCHO-PHYSIOLOGICAL THEORY OF HYSTERIA.**
ALBERT SALMON (Florence), *Journ. Ment. Sci.*, 1916, April, p. 378.

THE author is of the opinion that hysteria finds its clearest explanation in the study of kinæsthesis. Just as this function elucidates the mechanism of all our voluntary and automatic actions, in the same way it explains the mechanism of hysterical actions, which are effected according to the laws which regulate all voluntary and automatic acts. The fundamental condition of this affection is a hyperæsthesia or an active impressionability of the kinæsthetic centres, whence the formation of fixed kinæsthetic images, endowed with a strong affective and motor tendency, which, attracting to themselves all the nervous dynamic energy, bring about a disequilibrium of kinæsthesis, and consequently modifications of the personality peculiar to hysterics. The relations existing between kinæsthesis and the emotions (Sollier) explain the importance of affective causes, and of emotionalism in the determination of this affection. The kinæsthetic images would constitute the intermediate element between the emotion and the hysterical act, which would explain the absence or rarity of this malady after very intense emotions which ordinarily cause kinæsthetic depression, and the period of latency which often intervenes between the emotion and the hysterical phenomenon. It

would also explain the capability which hysterical troubles possess, created by emotions and affective ideas, of repeating themselves independently of these latter. Similarly, by this theory can be shown the relations which exist between organic lesions and hysteria, relations which purely psychological theories of this affection are powerless to explain. The kinæsthetic theory furnishes us with an explanation of the impulsive and plastic power of affective ideas, the power by which these promptly translate themselves into corresponding acts, and sometimes into abnormal somatic phenomena, such as vaso-motor, secretory, &c., troubles, which are themselves merely the expression of an exaggerated reactivity on the part of the kinæsthetic centres.

H. DE M. ALEXANDER.

ALCOHOLISM. ERNEST B. EMERSON, *Boston Med. and Surg. Journ.*, (376) 1915, July 22.

PRIMARILY a nervous disease. Time of arrival of the unbreakable habit is unknown. Alcohol has done more to fill prisons, insane hospitals, and feeble-minded institutions than all other causes. At Bridgewater, Mass., 20 per cent of first admissions are alcoholic insanity, 40 per cent. of the rest to some form. In 1912-13, of 4,681 sentenced to State Farm, 4,136 were for drunkenness, or 88 per cent. Majority of other crimes due to alcohol indirectly.

Causes are social, psycho-neurological, environmental, and hereditary. Gives vivid descriptions of acute alcoholic hallucinosis, auditory hallucinosis, delirium tremens, chronic delusional states; three cases. Punitive measures fail; society made him, so has no right to punish him.

(Authoritative and thorough paper for prohibition use.)

WALTER B. SWIFT.

THE TREATMENT OF DRUG ADDICTION. D. K. HENDERSON, (377) *Glasgow Med. Journ.*, 1916, March.

THE use of narcotic drugs is so widespread, and causes such havoc, that as wide publicity as possible should be given to any successful methods of treatment.

In this paper the Towns-Lambert and Norwood methods are described, and the value of the former is especially dwelt upon.

Cases are detailed, and it may be said that out of 40 cases, 32 or 80 per cent. were successfully freed from their addiction with a minimum of discomfort by using the Towns-Lambert method. These methods, however, must not be looked on as

"cures," but are only useful in so far that they give the patients a chance of readjusting themselves in a healthy way.

It is only by stringent legal measures, and by thorough after-care treatment and supervision, that one can hope to lesson the vice of drug addiction. AUTHOR'S ABSTRACT.

ON THE BACTERICIDAL POWER ACQUIRED BY THE SERUM
(378) **AFTER THE ADMINISTRATION OF SALVARSAN OR NEO-SALVARSAN.** S. R. DOUGLAS, *Lancet*, 1916, Jan. 22, p. 181.

NEOSALVARSAN and salvarsan in watery solutions possess a very distinct bactericidal power against staphylococcus when the strength of the solution is 1 in 6,000. When the solvent largely consists of blood or serum, this power is slightly diminished.

The administration of neosalvarsan in ordinary doses renders the blood fluids markedly bactericidal. This power lasts but a short time, and seems to reach its maximum about one hour after the administration of the drug, diminishing rapidly in the third and fourth hours. This is not due to the development of immune bodies in the serum, as heating the serum to 60° C. has no deleterious effect on this bactericidal power, and suggests that the bactericidal power is due to some arsenic compound in solution in the blood serum.

Salvarsan gave practically no demonstrable bactericidal power to the patient's serum when ordinary therapeutic doses were administered, but organisms treated with serum obtained within three hours of the administration of the drug grew much more slowly, and were agglutinated into masses.

In view of the very distinct bactericidal power which the serum acquires after neosalvarsan, it is hoped its administration may have a beneficial effect on wound and other septicæmias, and even assist in the sterilisation of deep and irregular suppurating wounds. A. NINIAN BRUCE.

THE CEREBRO-SPINAL FLUID IN THE SYNDROME OF
(379) **CERVICAL RHEUMATISM ASSOCIATED WITH SCIATIC NEURALGIA. (Le liquide céphalo-rachidien dans le syndrome de rhumatisme cervical et de névralgie sciatique associés.)** P. NOBÉCOURT, ESCALLON, and PEYRE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 378.

THE writers made a chemical and cytological examination of the cerebro-spinal fluid in forty cases presenting the syndrome recently described by Nobécourt. The most characteristic changes were the hypertension and increase in the albumin, which varied from gr. 0·06 to gr. 0·80 per litre. The cytological changes were

less frequent. There was either a lymphocytosis or a mixed reaction in which either lymphocytes or polymorphs predominated. The meningeal reactions explain such symptoms as severe frontal headache, pain on ocular pressure, sciatic neuralgia, nuchal rigidity, and Kernig's sign. The almost immediate relief afforded in most cases by lumbar puncture demonstrates the rôle of hypertension in the causation of these symptoms. J. D. ROLLESTON.

THE UREA CONTENT OF THE CEREBRO-SPINAL FLUID: With special reference to the diagnosis of uræmia. (380) R. G. CANTI, *Lancet*, 1916, Feb. 12, p. 344.

THE normal physiological urea content of the cerebro-spinal fluid, as measured by the hypobromite method, is below 0 05 per cent.

Cases clinically diagnosed as uræmia fall under two headings: (*a*) Those with a high urea content. All proved fatal. (*b*) Those with a low urea content. Many recovered.

Cases not clinically diagnosed as uræmia fall also under two headings: (*a*) Those with a high urea content. All were complicated by other than renal disease, which masked the symptoms. (*b*) Those with a low urea content.

The term "uræmia" is used to group together a set of signs and symptoms found in pathological conditions of the kidney. Excess of urea in the system is not of itself the cause of "uræmia" The term is thus vague and fallacious, but is useful. Of cases diagnosed as uræmia and proving fatal, the quantity of urea in the cerebro-spinal fluid is usually about ten times, and may be more than twenty times the normal amount. These may be called "true uræmia." A greatly increased quantity of urea in the cerebro-spinal fluid is always fatal within a short period. Of a few cases of large or small white kidney diagnosed as uræmia, little or no excess of urea was found in the spinal fluid. Those which recovered had no fits, and those which died had cerebral lesions. Cases of cardio-vascular disease (arterio-capillary fibrosis), with symptoms diagnosed as uræmic, contain no excess of urea in the cerebro-spinal fluid. They tolerate badly treatment directed towards overcoming a toxic condition of the blood and tissues, and respond to cardiac stimulants. The term "uræmia" should not be employed for these. A. NINIAN BRUCE.

THE COLLOIDAL GOLD PRECIPITATING SUBSTANCE IN THE CEREBRO-SPINAL FLUID IN PARESIS. (381) PAUL G. WESTON, *Journ. Med. Research*, 1916, xxxiv., p. 107.

AN attempt was made to determine the nature of the substance in the cerebro-spinal fluid obtained from cases of paresis which

causes the precipitation of gold from colloidal suspension, and the action of peptone and albumoses on colloidal gold was studied. Colloidal gold was not found to be a delicate or reliable test for minimal quantities of peptone. The salts, copper sulphate-reducing substance, and Wassermann reacting substance in spinal fluid from cases of paresis do not precipitate gold from colloidal suspension when the fluid containing them is used in the same or greater quantities than is used in Lange's test. The Wassermann reacting substance is not dialysable. The gold precipitating substance, and a substance which gives a faint precipitate with saturated solution of ammonium sulphate (globulin ?), are dialysable through thimbles impermeable to albumin. The gold precipitating substance is destroyed by heat. It is, therefore, not peptone. Its exact nature has not been determined. A. NINIAN BRUCE.

PSYCHIATRY.

THE TREATMENT OF PARESIS. BRITTON D. EVANS and (382) F. H. THORNE, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 623.

A REPORT of the treatment of fifteen patients suffering from paresis with salvarsan and neosalvarsan. Fourteen of these patients were treated by the intraspinous method of Swift and Ellis, and one by the intraspinous and intracranial methods combined. The technique employed is described.

The largest number of intraspinous treatments given to one individual was ten, and the smallest number three. In the case in which the intracranial method was used, two intracranial treatments were given at four weeks' interval along with three intraspinous treatments. Three patients showed mental and physical improvement; five showed physical improvement only; two died during the course of treatment; two died—ten and thirteen months respectively—after treatment was discontinued; the remainder showed no improvement whatever. One of the patients who is noted as showing mental and physical improvement died with convulsions ten months after treatment had been discontinued.

The general conclusions may be summed up as follows:—

"The improvements which we have observed following our treatments may be seen among the same number of paretics who have received no special treatment."

"The intracranial method seems to be unnecessary. The same results can be obtained with the intraspinous method."

D. K. HENDERSON.

THE INTRACRANIAL INJECTION OF SALVARSANISED SERUM. DREW M. WARDNER, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 643.

(383)

ON the day previous to operation the patient is given a full dose of salvarsan intravenously. The blood drawn from the patient's arm is then prepared according to the method of Swift and Ellis. At operation the patient is given an ether anæsthetic, a small skin flap is turned back in the anterior temporal region well above the ear, and a trephine hole about 1 cm. in diameter is bored in the skull by a Hudson drill. A lumbar puncture is made, and 30 to 40 c.c. of spinal fluid withdrawn. A bent salvarsan needle is then carefully pushed through the dura, and 40 to 50 c.c. of the serum allowed to flow in by gravity. After two weeks the procedure is repeated upon the opposite side. Subsequent applications are made at intervals of two weeks, the same trephine hole being used for the injection of the fluid.

This report is based on the treatment of fourteen cases of paresis, each individual of which has had from four to twelve treatments.

Five cases have improved sufficiently to be able to go back to their work, and to date have remained well for from seven to eleven months. At the end of eleven months one of these cases had a bad relapse, but on being returned to the hospital responded well again to treatment. Three cases have improved sufficiently to have parole of the grounds. Three others have shown some slight improvement, both mentally and physically. Two cases have died, and two have shown no improvement.

One hundred and two operations have been performed without untoward results in any case. D. K. HENDERSON.

A UNIQUE MURDER CASE, WITH APPLICATION OF NEW LAW GOVERNING EXPERT TESTIMONY. JAMES W. PUTNAM, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 659.

(384)

A POLE, 43 years old, on 31st March 1915, suddenly, without any provocation, shot a young man whom he had never seen before. Following the act he sent for the police and told them what he had done.

In December 1914 the patient's mother had been killed, and the thought then came to him that, seeing his mother had been killed, he ought to kill someone. On the morning of 31st March 1915 he said: "The time has come; I must kill someone."

When indicted for the crime he pled guilty, and stated that he did not want an attorney to defend him.

Owing to the unusual circumstances of the crime an Act passed

by the Legislature in 1915, which provided that the court may appoint its own expert to examine a defendant accused of crime, and report to the court, and either the people or the defendant may put the court's expert upon the stand for examination, was brought into force.

The accused refused to co-operate in any way during the medical examination, and at his trial maintained that he was guilty of the crime, and that consequently there was nothing more to be said.

The writer maintained that the man knew the nature of the act, namely, that he was killing a man; that he knew it was contrary to the laws of the state, because he immediately sent for the police; but that he did not know the quality of the act, because he at times laid the responsibility on God. The jury acquitted the accused on the ground of insanity, and committed him to the State Institution for Insane Criminals.

D. K. HENDERSON.

THE SENSIBILITY OF THE NIPPLE AREA WITH REFERENCE (385) **TO MENTAL DISEASE.** MILDRED E. SCHEETZ, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 611.

IN thirty cases of typical hysteria, Graves found that areola-nipple anæsthesia, associated with hyperalgesia, was a pathognomonic and fairly constant stigma. Franz and the author, however, have been able to show that the above condition is not found only in cases of hysteria.

Owing to the prominence given to the sexual side, or origin, of certain psychoses, the present work was undertaken with the possibility of discovering some concomitant sensory changes in the reproductive organs, both primary and secondary.

Ten cases were investigated in which a sexual emotional content appeared to be a prominent exciting factor. In the nipple area tests were made of light touch, pressure, and pain, as elicited by pin-pricks. After the first series of tests, erection of the nipple was produced, and the tests were repeated. A series of tests for "free word associations" to deep touch was also made.

The more important conclusions are:—

(1) A decrease or lack of sensitivity to light touch throughout the whole areola-nipple region.

(2) The exaggeration of pain sensations, both in the erected and unerected states, but more intense in the former.

(3) The "reference" of the sensations to the true sexual organs; at times by the stimulation of the unerected nipple, but in nearly every case when the erected nipple is stimulated.

(4) Anæsthesia with hyperalgesia of the nipple area is probably only a slight variation of a normal condition.

D. K. HENDERSON.

PATHOLOGICAL FINDINGS IN THE SYMPATHETIC SYSTEM IN THE PSYCHOSES. A. MYERSON, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 591.

(386)

IN this paper the results of the examination of the semilunar ganglia, from fifty consecutive autopsies performed at the Taunton State Hospital, are reported. The changes found are not considered to be in any way related to special mental syndromes.

The author has found that the semilunar ganglion is apparently often acutely injured in general infections, and in enteritis, and five cases are reported, *e.g.*, an acute exhaustion psychosis in a woman of 50 years, three cases of enteritis ending in death, and one case of senile dementia, in which the axonal reaction was manifest.

Degenerative changes, *e.g.*, pigmentation, nuclear changes, capsular changes, and changes in the interstitial connective tissue, are designated under the general term neurothrepsia, and are thought to represent an early and marked senility. Marked reactive changes (lymphocytes, plasma cells, &c.), such as are prominent in the central nervous system, are absent even in cases of general paralysis. In one case of bovine tubercular enteritis examined there was found to be an increase of eosinophilic connective tissue cells which seemed to have a phagocytic attraction for injured nerve cells.

In the author's experience the above findings apply only to the psychoses.

D. K. HENDERSON.

THE WASSERMANN TEST IN PRACTICAL PSYCHIATRY. L. G. LOWREY, *Amer. Journ. Insan.*, 1916, lxxii., April, p. 601.

(387)

A STATISTICAL study concerning the frequency of the Wassermann reaction in 1,600 admissions to the Danvers State Hospital. The reaction was performed as a routine part of the examination, and none of the cases were selected. Out of the 1,600 cases, 256 or 16 per cent. gave a positive result, 62 or 3·8 per cent. gave a doubtful result, and 1,282 or 80·1 per cent. gave a negative result. Of these 1,600 cases, 168 were diagnosed as cases of paresis or cerebral syphilis (one case), and of these 87·5 per cent. were positive.

The spinal fluid was examined in two main types of cases—(*a*) those with positive or repeated doubtful tests in the blood;

(*b*) those with clinical signs pointing to paresis (or other organic condition), and negative blood test. Altogether the spinal fluid was examined in 276 cases. It was found that of 109 cases with positive blood and spinal fluid, 106 were paretics, one was an imbecile, one a drug case, and one a psychoneurotic.

Of 143 tests on the spinal fluid of paretics, 123 or 87 per cent were positive, and only 8 per cent. were negative.

D. K. HENDERSON.

(388) **RELATIVE DEGRESS OF DULNESS AND BACKWARDNESS IN SCHOOL CHILDREN, AND THEIR CAUSATION.** H. R. BURPITT, *Journ. Ment. Sci.*, 1916, April, p. 394.

THE investigation deals with 400 children between the ages of 7 and 14 who were dull and backward, and yet outwith the Mental Deficiency Act of 1913. The children were classified according to the number of standards he or she was behind the normal—a normal child, aged 8, reaching Standard I., and progressing one standard for each subsequent year. To estimate the relative extent of the retardation, it is better to express the backwardness by some form of equation indicative of the degree of backwardness in ratio to the normal. A simple manner of estimating this is given. Illustrative tables are appended.

The chief cause of backwardness in school children is inherent mental incapacity.

H. DE M. ALEXANDER.

(389) **CAUSATION—WITH A CHAPTER ON BELIEF.** CHARLES A. MERCIER, *Journ. Ment. Sci.*, 1916, Jan., p. 1; April, p. 241.

THIS article does not lend itself to abstraction. It is of the nature of a treatise, and is to be published shortly in book form.

H. DE M. ALEXANDER.

(390) **GENERAL PARALYSIS OF THE INSANE IN FEDERATED MALAY STATES.** WILLIAM F. SAMUELS, *Journ. Ment. Sci.*, 1916, April, p. 411.

SYPHILIS in the Malay Straits is common, but general paralysis was said to be unknown. The author, however, found that during the years 1912, 1913, 1914, 3·70 per cent. of the male admissions, and 2·26 per cent. of the female admissions, were cases of this disease.

H. DE M. ALEXANDER.

(391) **NUCLEINATE OF SODA: ITS USE IN ACUTE MENTAL DISORDERS.** COLIN M'DOWALL, *Journ. Ment. Sci.*, 1916, April, p. 403.

THE leucocyte count in excitement with confusion, and in the majority of cases of depression, is raised at the beginning of the attack, and the author, in order to accentuate and prolong this

defensive leucocytosis, dissolved 20 grs. to 1 drm. of nucleinate of soda in sterilised water, and injected it into the arm of the patient whenever the leucocyte count fell. Six cases of excitement and six cases of depression were selected, and details of four of these cases are given. The author discusses the physical and psychical effect of the injection of the drug arising from the local and general reaction which it produces. It is of no service in melancholia. H. DE M. ALEXANDER.

Reviews

STUDIES IN ANATOMY. From the Anatomical Department of the
(392) **University of Birmingham.** Published by the Council of the University, and edited by Prof. PETER THOMPSON. Pp. 208, with many illustrations, some coloured. Cornish Brothers, Birmingham. 1916. Price 10s. net.

THIS volume consists of seven different papers, three of which have not previously been published, and represents a part of the investigations carried out in the Anatomical Department of the University of Birmingham during the last three or four years, and published by the Council of the University.

The first paper consists of a description by Professor Thompson of a human embryo, 7 mm. greatest length. A complete model was made magnified fifty times. The brain and spinal cord are described, and show a close resemblance to the brain of His's embryo Br^2, and Elze's specimen of 7 mm. The variations are noted, and a few points of special interest emphasised. The hypophyseal pouch is in open communication with the mouth on its dorsal wall by a relatively large aperture. The infundibulum is recognisable as a shallow depression in the floor of the diencephalon, and is placed opposite the swelling on the wall of the oral aperture. The hypophysis is thus at a very interesting stage of development at this time. A beautiful coloured plate of the embryo in profile accompanies this paper.

Among the other facts of neurological interest is a paper, with unfortunately no illustrations, by Dr J. P. Good, entitled "An Inquiry into the Causation of Spina Bifida," in which a careful analysis of ten cases in human fœtuses about full time is recorded, as well as one case in a fœtal ferret (*v.* p. 253).

The other papers deal with the embryology of the ferret, with notes on the early development of the nervous system in this

animal; on the dissection of an agnathic fœtus, in which the brain and spinal cord appeared normal; on a case of partial failure of torsion of the intestinal loop; on the head notochord and pharyngeal bursa in the ferret; and on the development of the lobus quadratus of the liver.

The papers reach a high standard of excellence, the illustrations, especially the coloured ones, are beautifully reproduced, and the general appearance of the volume is most satisfactory. Professor Thompson is to be congratulated on the appearance of the first volume of the "Studies in Anatomy" from his department.

THE RAT. Reference tables and data for the Albino Rat (*Mus norvegicus albinus*) and the Norway Rat (*Mus norvegicus*). (393) Compiled and edited by HENRY H. DONALDSON. Pp. v.+278. Memoirs of the Wistar Institute of Anatomy and Biology, No. 6. Philadelphia. 1915.

DR DONALDSON is well known on account of the numerous papers which he has published during recent years upon the central nervous system of the Norway and albino rat. He has here collected together most of the literature which has appeared in connection with these two animals, and incorporated them with his own researches. The result is the present monograph, which is the most extensive contribution to our knowledge of this animal which has yet appeared.

The rat is one of the most widely used laboratory animals, and is the one mammal easily obtainable both wild and in a domesticated form. The latter is represented by the albino or pied rat. This species is cosmopolitan, lives about three years, and breeding begins after about three months. It crosses readily with the Norway rat, the parent form from which it is derived.

An interesting chapter gives us the early records and migrations of the common rats. The greater part of the book, however, deals with the albino rat, its anatomy, physiology, and pathology being considered; while the largest portion is occupied by tables showing the growth in total body weight according to age, growth of parts or systems of the body in weight, growth of parts and organs in relation to body length and age, growth in terms of water and solids, and growth of chemical constituents. The difficulty in keeping the Norway rat happy and contented in captivity is considerable, but records are also given here of the growth in weight of parts and systems of the body, growth of organs in relation to body length, and growth in terms of water and solids. The book closes with a remarkably complete list of

references to the literature, occupying more than fifty pages, and followed by an index.

The amount of work and data here included is very great. The information is given in great detail, and complete references are given to the weight of the central nervous system at different periods of life, the percentage of fluid present, the number and size of the fibres present in the spinal nerves, and many other points, all collected with great labour and care. It should prove of considerable value to those engaged in original work in which this animal is utilised.

HUMAN PHYSIOLOGY. Professor LUIGI LUCIANI (of Rome). Trans-
(394) **lated by Frances A. Welby, with a Preface by J. N. Langley, F.R.S. Vol. III. Muscular and Nervous Systems. Pp. x.+667, with 308 figs. Edited by Gordon M. Holmes, M.D. Macmillan & Co., Ltd. London. 1915. Pr. 18s. net.**

SINCE the publication of the English translation of Vols. I. and II. of this work, the fourth Italian edition has appeared, and this, the third volume, has accordingly been translated from this later edition. This edition appeared in 1913, and was made the occasion of the presentation to the author of a commemorative medal and an album containing the autographs of almost all the world's most eminent physiologists.

We may say at the start that we regard this book as one of the most masterly expositions of the subject of nervous physiology which have appeared during recent years. The method of the author of introducing each subject by a brief preliminary historical sketch pointing out the principal steps in our knowledge, followed by a critical description and discussion of the present views held, is particularly to be commended. Each chapter is accompanied by an extensive bibliography.

The first three chapters are devoted to the physiology of the muscular system. The opening chapter deals with the general physiology of muscle. It occupies ninety-five pages, and while describing clearly the views of most workers upon the subject, gives a criticism of these views in a most convincing manner. It is well illustrated. The author does not follow the conventional lines throughout, and where he differs from them he expresses himself without hesitation. The second chapter deals with the mechanics of the locomotor apparatus, a subject often neglected in text-books of physiology. It discusses the line and centre of gravity of the body in different postures, the mechanics of equilibrium, and the movements of the body in walking, in running, and in swimming.

"On an average the human body as a whole is heavier than fresh water (1·010), but its gravity differs little from, and is even somewhat less than, that of salt water." "An adult man (especially if very fat) can easily float on the sea, if he keeps all his muscles relaxed. Thin people, however, whose average specific gravity is rather higher than that of salt water, are unable to float in the supine position without the help of slight impulsive movements of the feet."

The third chapter is concerned with phonation and articulation. The larynx is described carefully, the muscular attachments and larnygeal nerves being discussed at some length. At puberty, "owing to the elongation of the cords, the voice generally falls an octave in the male and about two notes in girls." Among other experiments recorded, some of the most interesting show impressions left on the roof of the mouth by the tongue stained by cocoa powder or carmine previous to articulation. The difference between spoken and written language "is greatest in the English language, in which the written or printed words are not so much a symbolic representation of the different tones and sounds of which they are built up, as mere mnemonic signs—a little plainer and more expressive than the hieroglyphics of the ancients."

The nervous system is next considered, and the neuron theory comes at once under criticism. "The neuron theory, which regards the elementary components of the nervous system as morphologically distinct, is not based on any conclusive evidence." Whether the axis-cylinder is an outgrowth from the nerve cell, or is formed by the fusion of many cells arranged in series which only contract relations with the ganglion cells at a later time, "is still unsolved." It is far from proved that in fully developed tissues the so-called "neurone" represents a true morphological unit, and is not a fusion of many elements, or *syncytium*; nor that these neurones do not enter into close relation by direct continuity of their protoplasmic substance; nor, lastly, is the idea of a diffuse fibrillary network which, both in the central grey matter and at the periphery, knits the several neurones into a single unitary system, comparable with the vascular system, by any means excluded."

The general physiology of nerve is discussed at length, the electrical phenomena in particular being fully treated. The spinal cord and nerves next come under consideration. The spinal cord represents a series of central organs (*myelomeres*) which are intimately connected, and more or less unitary in their functions. The predominating function of the myelomeres is "*reflex activity*." "This term, borrowed from the physicist—who speaks of the reflection of light and heat rays—corresponds ill

with the physiological phenomena which it is intended to connote." The true reflex character of the patellar reflex or knee jerk is not universally admitted, but is almost certainly correct. The work of Sherrington and others is reviewed.

The sympathetic system is next dealt with. This term is preferred to the more physiological title, "autonomic nervous system," "since this autonomy is incomplete, and there are close anatomical and physiological relations between the visceral system and the cerebro-spinal axis," which make the older nomenclature more consistent.

The last four chapters are important, and discuss the physiology of the medulla oblongata and cerebral nerves, the hind-brain, the mid-brain and thalamencephalon, and the fore-brain. Excellent historical and critical discussions of the function of the cerebellum, of the optic thalami, of the motor and sensory areas of the cerebrum, of aphasia, and of many other equally important subjects too numerous to mention here, are given. The author does not agree with the theory that ascribes special value in regard to mental functions to the prefrontal lobes. The book is extensively illustrated. There is a subject and an author's index.

INSTINCTS OF THE HERD IN PEACE AND WAR. W. TROTTER. (395) Pp. 213. T. Fisher Unwin, Ltd., London. 1916. Pr. 3s. 6d. net.

AMONGST animals there are some whose conduct can be generalised very readily in the categories of self-preservation, nutrition, and sex, whilst there are others, of which the dog or the bee are an example, whose conduct cannot be thus summarised. These animals, whose conduct it is difficult to generalise under the primitive categories, are gregarious, and it can be shown that gregariousness is of a biological significance approaching in importance that of the other instincts, and is the source of these anomalies of conduct. As man is also gregarious, the complexity of human behaviour is to be traced to the same source.

The importance of applied psychology is becoming gradually better realised. Psychology permeates and pervades life from the cradle to the grave, and no more important time for the study of its application could be found than the present, when the motives which influence the actions of individuals and of nations are thrust so prominently forward. The war is becoming more and more a contest of moral forces, and understanding of these forces is a necessity. Gregariousness is frequently regarded as a somewhat superficial character, not of fundamental importance and not likely to be deeply ingrained in the inheritance of the species. This

method of regarding the social habit is, in the opinion of the present writer, not justified, and prevents the attainment of conclusions of considerable value. From the biological standpoint, the probability of gregariousness being a primitive and fundamental quality in man seems to be considerable. It is owing to the failure to investigate the effects of gregariousness in the mind of the normal individual man that the theoretical side of crowd psychology has remained incomplete and relatively sterile. Taking a broad survey of all gregarious types, three fairly distinct trends of evolution may be distinguished. First, there is the aggressive gregariousness of the wolf and dog; second, the protective gregariousness of the sheep and the ox; and third, there is the more complex social structure of the bee and the ant, which we may call socialised gregariousness. Socialised gregariousness is the goal of man's development It is characterised by the complete absorption of the individual in the major unit, and the fact that the function of the social habit seems no longer to be the simple one of mere attack or defence, but rather an elaborate mechanism for making use by co-ordinate and unified action of the utmost powers of the individual members. Such a principle as national unity must necessarily be a manifestation of the social instinct, and is thus limited to one of the three above types. No nation has ever made a conscious choice amongst these three types, but circumstances have led to the adoption of one of them. The more or less purely aggressive or protective form has been adopted for the most part by primitive peoples. The aggressive is well illustrated by Germany to-day, and it is impossible not to recognise in them the same psychological ideals which we might suppose a highly developed breed of wolves to entertain. It is a type of society which has not proved capable of prolonged survival. The history of the world has shown a gradual elimination of the lupine type. It has recurred sporadically at intervals, but has always been suppressed. England, on the other hand, illustrates the socialised type of gregariousness with all its slowness of development. To understand German psychology it is only necessary to regard it from the point of view of the aggressive gregariousness of the wolf pack, as shown by the massed attacks, the savagery, over-valuation of fear and self-interest, the defective insight into the minds of others, the harshness of superiors to inferiors, and its dependence upon continuous aggression for success, &c. "One may risk the speculation that this conflict is between socialised gregariousness and aggressive gregariousness."

A TEXTBOOK OF NERVOUS DISEASES for students and practising
(396) **physicians. In thirty lectures. By ROBERT BING, Dozent for Neurology at the University of Basel. Only authorised translation by Charles L. Allen, M.D., Los Angeles, California. Pp. xiv + 481, with 111 illustrations in the text. Wm. Heinemann, London. Pr. 21s. net.**

THIS is a textbook which will appeal specially to the student and the non-neurologist, for whom it is, in fact, written. It therefore is concerned principally with those diseases of the nervous system which are more frequently met with in daily practice, and lays most stress upon subjects of special importance to the ordinary physician, such as the nervous manifestations of arteriosclerosis, the treatment of tabes, of neuritis and neuralgia, the psychology of the neurasthenic, &c. The object of the author has been to present particularly his own experiences and views, and these he gives here in the form of thirty lectures. This has necessitated considerable condensation of matter, with frequent introductions of titles, summaries in tabular form, and recapitulatory headings. For instance, tables are given showing the muscles which the different spinal nerves supply and their respective functions, the disturbances of sensation resulting from injury to the various sensory spinal nerves, the Valleix pressure points in trigeminal neuralgia, the segmental innervation of the trunk, arm, and leg muscles, &c., all of which make the book useful for reference.

The general symptomatology and diagnosis of nervous diseases is here dispensed with, as is also a preliminary account of the pathology of each individual affection. Instead, the clinical picture is at once described, and the methods of examination and interpretation of the different neurological symptoms and syndromes explained. Attention is paid to differential diagnosis and to treatment, many prescriptions being incorporated.

In the arrangement of the subject matter, the customary topographical and pathologico-anatomical classification has been subordinated to the etiological and pathologico-physiological, thus enabling the author to group together the different syphilogenic diseases of the whole central nervous system, the diverse varieties of spinal "transverse lesions," the different diseases of the cerebellum, the dyskinesias, the "dysglandular symptom-complexes," congenital and early acquired defective conditions, &c. The illustrations are numerous, and much attention has been paid to make the index as complete as possible.

Although the author has incorporated his own experiences so extensively, the observations of other workers are usually briefly and satisfactorily summarised and criticised. Rarer nervous diseases are, as a rule, only briefly referred to. Numerous

interesting clinical cases are introduced, of which we quote the following case of general paralysis described by Tuczeh. A man, who in his grandiose delusions declared himself Pope, Emperor of Germany, King of Darmstadt, and father of 137 boys born at the same time, presented the characteristic somatic stigmata of paresis. After repeated paretic seizures he passed into a condition of advanced cachexia. He then slowly recovered both physically and mentally, returned to work as a conductor, and was promoted five years later "on account of exceptionally good work." Two years later he had to give this up on account of tabes, and died twenty years after the beginning of the intromission. At the autopsy Knoblauch found in the brain none of the alterations characteristic of progressive paralysis.

The chapters on epilepsy, neurasthenia, hysteria, and migraine are good, and form short digests of much of our present knowledge. The importance of not relying upon palpation of the peripheral arteries for determining cerebral arteriosclerosis is emphasised. It is very questionable if the frequently affirmed causal relationship of migraine to gynecological, rhinological, or stomach diseases is correct.

This book ought undoubtedly to prove valuable to the general practitioner.

TEXTBOOK OF NERVOUS DISEASES for the use of students and practitioners of medicine. By CHARLES L. DANA, A.M., M.D. LL.D. Eighth edition. Pp. x+632, with 262 illustrations, including four plates in black and colour. John Wright & Sons, Ltd., Bristol. 1916. Pr. 21s. net.

(397)

THE first edition of Dr Dana's well-known textbook of neurology was published twenty-three years ago. At that time Dr Dana made the interesting statement that there are "about sixty-five nervous diseases which are either very common or extremely important," and about a hundred and seventy-six altogether. The eighth edition has now been reached. In the earlier editions a considerable amount of space was devoted to the anatomy of the central nervous system, a need which is now abundantly supplied by general and special text-books, and therefore a large portion of this part of the text has been omitted, and only what is directly useful for diagnosis and reference retained. The greater part of the rest of the book has also been completely remodelled, rewritten, and brought up to date. In many cases recent work has been summarised or revised by the original author or by some prominent worker on the subject, *e.g.*, protopathic and epicritic sensibility by Dr Head, serology of nervous diseases by Dr Kaplan, &c.; the chapter on acute anterior poliomyelitis has been rewritten by

Dr Foster Kennedy, and that on epidemic cerebro-spinal meningitis by Dr H. W. Frink, while the chapters on tumours of the spinal cord and of the brain have been based on statistics supplied by Dr Charles A. Elsberg. The chapters on the psychoneuroses have been rearranged and in parts rewritten. Neurasthenia has been pushed more into the background. Hysteria and psychasthenia have been treated from the standpoint of descriptive rather than analytic neurology. Attention is also paid to disturbances of growth of metabolism and of nervous function due to glandular disorders. The minor psychosis and general paralysis are included, but the part devoted to psychiatry will appear in a separate volume. The last chapter is devoted to cranio-cerebral topography. The book closes with an appendix giving the function and innervation of the different muscles, the symptoms which result from their deficient action, the segment of the spinal cord in which they are represented, and the diseases in which they are commonly involved.

The generous scale upon which the book is illustrated adds very considerably to its value, especially as, along with numerous original photographs, a large number are reproduced from other sources, *e.g.*, many of the anatomical illustrations are from the works of the late Prof. Cunningham. The pathological microphotographs are worthy of special note. A few interesting early reproductions of the brain by Stephanus, Willis, and Ruysch, representing anatomical illustration and art in the sixteenth, seventeenth, and eighteenth centuries respectively, have also been added.

"Nervous diseases are produced in part by predisposing influences, which may be likened to a fecund soil; in part they are due to exciting causes, which are like the seeds dropped upon the soil in the accidents of life." "So far as the office of parentage goes, persons of great talent in affairs, or great artistic genius in any direction, may be counted as neurotic, and are very likely to have children of neuropathic constitution." "The mother transmits neuroses more often than the father." "Mental work produces no injurious effect upon metabolism, and is a healthful form of activity, even intense and long-continued mental work being comparatively harmless. It is the worry and strain and emotional excitement associated with hard work that does harm and leads to neurasthenic disorders."

We have no hesitation in recommending this book as one of the best textbooks of nervous diseases which have appeared recently. It presents short but authoritative accounts of almost all the nervous conditions met with in ordinary practice, discusses their pathology, etiology, diagnosis, and treatment, and where possible explains their underlying anatomical and physiological basis.

A LABORATORY COURSE IN SERUM STUDY, being a series of
(398) **experiments and diagnostic tests in immunology carried out in an optional course given to medical and graduate students in the Department of Bacteriology, College of Physicians and Surgeons, Columbia University, New York, by the writers.** HANS ZINSSER, J. G. HOPKINS, and REUBEN OTTENBERG. Pp. xiii+184. The Macmillan Co., New York. 1916. Pr. 5s. 6d. net.

THIS book presents a practical course of study upon the subject of immunology, based on a course which the authors have conducted at Columbia University for the last four years, and which was offered as optional to second and third year medical students. The intention has been not so much to teach beginners practical diagnostic tests as to allow the student to carry out fundamental experiments, and thus discover for himself the underlying principles. Students are therefore taught to prepare their own material for injection, to immunise and bleed animals themselves, and to do all the manipulations necessary in the preparation of materials for the experiments that are done in the class. The course should, if possible, follow or be synchronous with lectures, reading, and demonstrations on the principles of infection and immunity, and should preferably follow a course of practical bacteriology.

The course is divided into thirty-two lessons arranged for two afternoons a week for a term of three and a half months. A time schedule is given showing at a glance the subject of each lesson, and the work preliminary to subsequent lessons, with a list of what is required to be prepared or obtained by the instructor before each lesson. The immunisation of animals, bactericidal and hæmolytic power of normal serum, hæmolysis, quantitative relations of amboceptor and complement, agglutinins, precipitins, preparation and titration of antigens, Wassermann reaction, titration of unknown antitoxin, tetanolysin and antitetanolysin, opsonins, preparation of bacterial vaccines and anaphylaxis, &c. are all carefully worked through.

The increasing importance of the subject of immunity, and the impossibility of teaching it without experiment and demonstration, make a course of serum technique essential for its proper understanding. The course here suggested is clear, simple, and concise, it is essentially practical and detailed, and is well worthy of the attention of all those who wish to obtain a working knowledge of serum technique.

BOOKS AND PAMPHLETS RECEIVED.

Ash, Edwin L. "Stammering and Successful Control in Speech and Action." Mills & Boon, London.

Krehl, Ludolph. "The Basis of Symptoms." 1916. J. B. Lippincott, Co., Philadelphia and London.

Review
of
Neurology and Psychiatry

Original Articles

THE HISTOLOGY OF DISSEMINATED SCLEROSIS.

By JAMES W. DAWSON, M.D.

WITH A

PRELIMINARY COMMUNICATION

By the late ALEXANDER BRUCE, M.D., LL.D., and JAMES W. DAWSON, M.D.

PREFACE.

THE research of which this paper gives an account was originated by the late Dr Alexander Bruce, and undertaken in conjunction with him; most of the material used had been accumulated by him during the later years of his life. The following preliminary communication made to the Pathological Society of Great Britain and Ireland in July 1910 represents in brief outline the position which had been reached at the time of Dr Bruce's lamented death:—

PRELIMINARY COMMUNICATION ON THE PATHOLOGY OF DISSEMINATED SCLEROSIS. By A. BRUCE and J. W. DAWSON. (Reprinted from *Journ. Path. and Bacteriol.* Cambridge, 1911, vol. xv. p. 126.)

The plaques in disseminated sclerosis, wherever they are situated, are distributed evidently without any relation to nerve tracts. Their character and appearance suggest a gradual infiltration from some central source into the surrounding or neighbouring tissues. In the cord their tendency is to pass inwards from the meninges in a more or

less wedge-shaped form, their relationship to blood-vessels being often difficult or impossible to trace except in the earlier stages. The cerebrum and cerebellum are better adapted to give an idea as to their mode of formation because of the independence of the arterial and venous paths. Within the cerebrum the veins pass towards the wall of the ventricles and the choroid plexus towards the veins of Galen, and have in this way a distribution altogether different from that of the arteries. The same is true of the cerebellum. A study of a series of sections shows that the plaques are deposited in relation to the distribution of the veins and to the walls of the ventricles. An examination of sections of the cerebral hemispheres strongly suggests that the infiltration is along the lymphatic channels surrounding the veins. Similar conclusions are suggested by study of the sections of the pons, cerebellum, and medulla.

For some years Dr Bruce's attention had been concentrated on the important part played by the lymphatics in disease processes in the central nervous system, and I had the honour of being associated with him in the investigations which he hoped would throw light on the subject. The earlier results obtained were recorded in the paper "On the Relations of the Lymphatics of the Spinal Cord" (*v. Review*, 1911, ix., p. 350), and more especially in that entitled "Multiple Neuromata of the Central Nervous System" (*v. Review*, 1913, xi., p. 117). As the above abstract shows, Dr Bruce found in disseminated sclerosis a disease which in his view accentuated the fact that in certain cases the effects of the causal agent fall especially on the lymphatic system. He was one of the first in this country to point out that in many cases the peri-ventricular sclerosis is the most important lesion in this disease, and that it frequently dominates the macroscopic and microscopic pictures. He formed the opinion that the lesions in the ependymal and peri-ependymal tissues are probably of especial significance, and he argued that the existence of such marked lesions around the ventricles raised the possibility of the cerebro-spinal fluid having toxic properties, and that the causal agent entered along the lymphatics in the peri-venous sheaths. At the same time the peri-vascular distribution of the areas in the central nervous system led him to recognise that the causal agent might also be disseminated by the blood channels. He was strongly convinced that the process was toxi-infective, and that the plaques were caused by a gradual infiltration of the tissue with toxic lymph passing

from a central focus, and, while recognising the limitations of the method, he hoped that the careful histological investigations of the morbid anatomy of the disease might ultimately throw light on the nature of the morbific agent which is at work.

Since Dr Bruce's death I have worked up more fully the cases on which our earlier joint observations were founded, and I have also investigated a considerable mass of new material which has more recently been available. This material includes a case which is of special importance, from the fact that a full clinical record taken under Dr Bruce's personal supervision is in existence, and also on account of its having a fatal issue after a comparatively short course. This more recent work, and especially the observation of the acute case alluded to, brought new facts to light, and necessitated a reconsideration of some of the earlier conclusions.

During three of the years I have been engaged in this work I held a Carnegie Fellowship, and I desire to thank the Trust for the assistance given and for generous grants towards expenses and towards the cost of illustration. My thanks are also due to the Committee of the Royal College of Physicians' Laboratory, Edinburgh, for the facilities afforded for the research, and to Professor Ritchie, the Superintendent of the Laboratory, for his sympathetic interest and criticism throughout the investigation. The coloured illustrations have been prepared by Mr Richard Muir, of the University Pathological Department, and the microphotographs by him, by Mr William Watson, of the Royal College of Physicians' Laboratory, and Mr Thomas Hamilton, my laboratory assistant; my acknowledgments are due to all of them for the care and skill they have exercised in executing the work.

This paper has been published in full in the *Trans. Royal Soc. Edin.*, 1916, l., Part iii. (No. 18), pp. 517-740, with 456 figs., which should be consulted for complete bibliography, &c.

CONTENTS.

Preface.
I. Introduction.
II. Historical.
III. Methods of Investigation.
IV. Histological Study—
(1) Introduction: Clinical History of Case I.
(2) Structure of Different Types of Areas.
(3) Characteristics in Special Situations.
(4) Changes in the Individual Tissue Elements.
(5) Other Histological Features.
(6) Conclusions: with Note on the Pathological Physiology.
V. Pathogenesis and Etiology —A Critical Discussion—
(1) The Nature of the Pathological Process.
(2) Its Origin.
(3) Etiological Factors.
(4) Mode of Action of the Causal Agent.
VI. Conclusion.
Bibliography.
Description of Plates.

I.

INTRODUCTION.

The following study is based upon the detailed histological examination of the nervous organs from nine cases of disseminated sclerosis. This name and its synonyms—multiple sclerosis, insular sclerosis, sclérose en plaques disseminées, Herdsklerose—indicate that the disease they designate has, as its chief anatomical feature, irregular sclerotic patches distributed throughout the central nervous system. Its manifestations, therefore, are protean, and an exact knowledge of its pathological anatomy is essential to the understanding of the various clinical forms of the disease.

The works of Charcot, who first gave classical pictures of the disease—the clinical and anatomical—show that to him the condition was a distinct morbid entity, and that it bore no relation to the other non-system diseases of the central nervous system. All subsequent studies have been influenced by the fundamental observations of Charcot, and around the three cardinal points emphasised by him, proliferation of glia, degeneration of nerve fibres, and blood-vessel changes, have been grouped the various theories put forward to account for the origin of the process.

The etiology of the disease remains absolutely obscure. The supposition of a selective poison acting through the blood-vessels,

which has received the support of most recent investigators, is justified as an hypothesis but remains undemonstrated as a fact. Chief interest has, therefore, centred in the pathological anatomy of the condition, and the object of this study has been to trace, by means of the most recent available specific staining methods, the characteristics of the pathological process and to determine, as far as possible, the histological changes which form its basis.

The earliest pathological studies in disseminated sclerosis were made in chronic cases of the disease, and the lesions described were the sclerotic areas found distributed in the brain and spinal cord. The recognition by later writers of acute stages of the disease and of cases of typical disseminated sclerosis running an acute course has caused me to direct special attention to the early changes and their relation to the development of the chronic sclerotic areas. In spite of the large number of works on the subject of disseminated sclerosis, its etiology and pathology present many problems for future elucidation. Our knowledge of the histology, especially of the early stages, has not kept pace with our recognition of the early clinical aspects of the disease. It was hoped, therefore, that a study of the earliest lesions, in tracing the rôle which falls to the various tissue elements before secondary factors had been introduced, would throw some light upon the nature and origin of the process.

No attempt has been made to give a complete representation of the literature of the subject. This is so extensive that it would scarcely have been possible, and, further, a detailed statement of all the hypothesis, often very vague and insufficiently based, seemed of little value. I have had in view, rather, a brief continuous account of the most important problems met with in the consideration of the pathological anatomy and pathogenesis of disseminated sclerosis. Having critically sifted all the available literature of the last twenty years, those writers have been chosen whose work has marked a new standpoint or an important step in our progressive knowledge of the subject. In the critical discussion on the nature, origin, and cause of disseminated sclerosis, the works of Borst (1904) and Müller (1904) have been freely drawn upon, and readers are referred to Müller's monograph for a complete bibliography up to 1904. A list of the more recent anatomical researches will be found at the close of this study.

The clinical notes of the cases were very incomplete, and no

attempt has been made to correlate clinical symptoms with the anatomical lesions in individual cases. The difficulty of bringing clinical symptoms into harmony with the anatomical findings in the central nervous system is a well recognised fact, but, from the frequency with which certain areas are affected, attention has been drawn in the note on the Pathological Physiology to the possibility of predominant anatomical lesions explaining certain clinical symptoms.

As the significance and interpretation of our observations depend largely upon the judgment we pass upon, and the importance we attach to, the methods of investigation used, I have given in considerable detail an outline of the methods employed. During the last third of the nineteenth century neuro-pathology laid special stress on problems affecting the localisation of nerve fibres in an endeavour to define accurately the position of diseased processes, and to follow out secondary degenerations while almost neglecting the histo-pathology of the diseased processes themselves. Nissl laid stress on the fact that practical neuro-pathology can and must be pursued without regard to definite ideas as to the functional significance of the individual component parts of the tissue. He pointed out that it is sufficient in the first place to collect pathological data regarding definite diseased conditions, and that for that purpose the changes in the supporting tissue—the glia and the vascular connective tissue—may be of greater importance and much more really decisive than the changes in the specific tissue elements—the nerve cells and nerve fibres—which are yet of greater functional importance. The classical methods of Marchi for early, and of Weigert for late, fibre tract degeneration have, therefore, been supplemented by modern specific and diffuse staining methods. The examination of small sections for the recognition of these finer histological details has, on the other hand, been supplemented by large brain sections through the whole hemisphere. These sections, stained with Weigert's myelin sheath stain and a diffuse cell stain, give a very instructive comparative representation of the gyri and their associated sulci, and an idea of the extension of the process.

The pathological process may be disseminated through brain, pons, medulla oblongata, and spinal cord, and may produce symptoms of a very diverse character. The possibility of any useful clinical classification is, therefore, very slight, and an

anatomical basis has been adopted for the classification of the various clinical types. According to the predominance of the symptoms the disease has been divided clinically into cerebral, spinal, and cerebro-spinal forms, and the different possibilities of anatomical distribution and localisation have led to a similar pathological classification. Probably no cases are purely of one type, and experience has shown that, if sufficiently careful search is made, sclerotic areas will be found in nearly all cases distributed through both brain and cord, though perhaps much more marked in one or other position. As far as we know from the findings in other organs of the body there is no widespread reaction to the etiological factor, such as is found in acute poliomyelitis. The anatomical findings point to a process localised in the central nervous system.

Before referring to some of the problems met with in the study of disseminated sclerosis it will be convenient to give an indication of the pathological changes found in a well-marked case of the disease. Williamson (1908) in his text-book gives a brief, clear description of the main features of the pathological anatomy, from which we take the following detached statements:—

"The pathological examination of the nervous system reveals patches of sclerosis scattered about in the most irregular manner in the brain, pons, medulla, and spinal cord. Both white and grey matter may be affected, though the former is more frequently the seat of the disease. The patches are in some cases grey in colour and sharply defined; in others greyish white and less sharply defined. Large patches in the cord, medulla, and pons may extend over the greater part of the transverse section. The largest patches are seen in the white matter of the brain. The older patches are firmer than the normal substance of the brain or cord, but recent patches are occasionally seen which are gelatinous and softer than the normal tissues. The chief macroscopical characters of the lesions are their insular character, their irregular dissemination, the absence of secondary ascending and descending sclerosis in most cases. This feature—the absence of secondary degeneration—sharply distinguishes disseminated sclerosis of the spinal cord from other multiple lesions, such as disseminated myelitis and multiple syphilitic lesions.

"Under the microscope a striking feature of many patches is their sharply defined nature. This feature is well seen in the

sections stained according to Weigert's method. Examination under a high power shows that medullated nerve fibres are generally absent in the sclerotic patches; but sometimes at the border of a patch there is a zone in which the medullated fibres are present, though scanty. At the periphery of some patches compound granular cells are found along with indications that the morbid process is still active. In the patches of sclerosis the axis cylinders of the nerve fibres are very often present though the medullated sheaths have disappeared. The ganglion cells of the grey matter escape degeneration for a long period in the diseased patch; but at a very advanced stage they, like the axis cylinders, may finally disappear. The neuroglia connective tissue in a diseased patch is often greatly increased and converted into a dense fibrous tissue. Spider cells may be present, but the neuroglia is not richer in nuclei than in the normal condition. In other cases the neuroglia, though increased in amount, has an amorphous or homogeneous appearance under the microscope. In some patches the nerve fibres have degenerated, and spaces are left in the neuroglia from which the true nerve elements have disappeared, but the connective tissue itself has not proliferated. Compound granular cells are often present, especially at the periphery of a patch. They are most numerous in recent patches, but may be absent in old patches. Often there are large epithelial-like cells in cavities near blood-vessels. The walls of the blood-vessels in some cases appear normal; in some cases they are thickened and hyaline or present evidence of endo- or peri-arteritis; in other cases (in recent patches) the peri-vascular lymph sheaths are filled with round cells, compound granular cells, and fat globules. Often a large altered blood-vessel is found in the centre of a patch of sclerosis.

"Four forms of sclerosed patches may therefore be met with: (1) patches in which nerve fibres have degenerated, leaving sieve-like small cavities in the neuroglia, whilst the neuroglia connective tissue itself has increased very little; (2) patches in which there is marked proliferation of the neuroglia along with degeneration of nerve fibres; (3) patches presenting diffuse proliferation of neuroglia, whilst the nerve fibres and cells persist; (4) recent patches presenting changes very similar to those of cerebral softening—products of nerve degeneration and myelin drops, fat granular cells, and distension of the peri-vascular sheath of the

blood-vessels with round cells. A point of importance is the presence of patches in various stages of development, in the same case; some patches presenting firm sclerosis, whilst others are soft and recent, and may resemble ordinary softening."

A brief reference must now be made to some of the main problems met with in the study of the pathology and pathogenesis of disseminated sclerosis. Recent works show how widely views differ regarding these, and how vague and confused are the issues placed before the reader. One reason for this seems to lie in the absence of any distinction being drawn between the question of the nature and that of the origin of the process. These are undoubtedly the two most important problems: (1) what is the nature of the process underlying disseminated sclerosis? and (2) where has it its origin, *i.e.*, in which structural element of the nervous tissue does it take its rise?

An attempt to answer the first of these questions has led many writers to a diffuse discussion regarding the distinction between inflammatory and non-inflammatory processes in the central nervous system. The views as to what constitutes true inflammation are nowhere so conflicting as when the term is used in connection with the central nervous system, and in the case of no other organ are the conceptions of different writers as to the relation of inflammation to pure degeneration so fundamentally opposed. The nature of chronic inflammation also is again nowhere so obscure as when the term is used in connection with the central nervous system. Schmaus (1903) has summarised the inflammatory process in the central nervous system under the general conception of a reaction-process, which may express itself by an increase in the vital activity of any of the tissue elements, and, for the purposes of this paper, the term is used in this sense.

The pathological anatomy of disseminated sclerosis bears no analogy to any other known pathological process in the body. We know, *e.g.*, of no process in other organs in which the relative integrity of the specific functioning parenchymatous tissue is associated with the enormous increase of the interstitial tissue occurring in definite circumscribed areas.

Further, experimental investigation has as yet thrown little light on this question: it has proved only that disseminated areas of myelitis may result in a reparative growth of neuroglia, but

it has not proved that areas of disseminated sclerosis proceed from an acute myelitis.

The attempt to define more clearly the nature of the process is rendered more difficult, therefore, by the difficulty of defining the term inflammation in the central nervous system, by the absence of analogies from the pathology of other organs, and by the absence of results realised from experimental investigations.

Two views in particular have been advanced to explain the nature of the process. Byrom Bramwell (1904) has succinctly summarised them thus :—"(1) That the sclerotic lesions are the result of some irritant which is distributed through the nerve centres by the blood-vessels. (2) That the disease is due to some developmental or congenital defect of the neuroglial or nervous tissue (perhaps similar to or analogous to the gliomotosis in cases of syringomyelia) which renders it more vulnerable or liable to be affected by irritation than the neuroglial or nervous tissue of the normal individual."

These views may be termed the exogenous and endogenous theories, using these words in their strictest meaning. The former ascribes to disseminated sclerosis an inflammatory process as its basis, and most observers accept the inflammatory nature of the process in some form. The latter view, strongly advocated by Strümpell, and supported by Müller in his monograph, looks upon disseminated sclerosis as a disease independent of external factors, except as "agents provocateurs." Müller distinguishes between true or primary disseminated sclerosis, a primary glia formation due to malformation of the glia—a disease *sui generis*—and secondary disseminated sclerosis, a myelitic form, one of a community of allied diseases. This standpoint, that a uniform explanation of all cases of disseminated sclerosis cannot be given, is taken up by many recent writers. Others, however, cannot recognise the existence of an acute or secondary disseminated sclerosis which differs in its evolution from the chronic forms, but whose pathological anatomy is yet almost identical.

Concerning the origin, as concerning the nature of the process, the views are no less divergent. Supporters of the endogenous theory see in disseminated sclerosis a multiple gliosis whose origin is, naturally, in the neuroglia tissue. Supporters of the inflammatory nature of the diseased process are, however, widely divided in their views regarding its origin. In a sclerotic patch

changes occur in the three separate structural elements of the tissue: (1) the nervous elements—the myelin sheath of the nerve fibre; (2) the interstitial tissue—the glia; and (3) the blood-vessels. The differing views are related to these three components, and according to the anatomical change most in evidence writers have ascribed the origin of the process to a primary parenchymatous change, a primary interstitial process, or a primary vessel alteration. We must undoubtedly differentiate three groups of changes, and the question constantly arises, which is primary and are the others secondary, *i.e.*, are they so related as to be cause and effect, or are they together due to the simultaneous action of the etiological factor? Many neuro-pathologists believe that here, as elsewhere, it is immaterial whether the reaction is discernible first in the parenchyma, or interstitial tissue, or vessels. It may be assumed that there are individual factors which, through the reaction of the tissues upon the unknown, though probably toxic, stimulation of the three components, determine the anatomical picture, allowing in one case one component and in another case another component to come to the front.

It is, therefore, clear that amongst the questions raised in any discussion regarding the nature and origin of disseminated sclerosis are the following: its relation to acute, subacute, and chronic inflammatory processes in the central nervous system, and, further, its relation to the different processes, *e.g.*, diffuse cerebro-spinal syphilis and diffuse arterio-sclerosis which have as their terminal product a sclerosed area.

In addition to its unexplained cause, nature, and origin, numerous other problems are met with in the study of disseminated sclerosis. A few of these falling within the scope of this paper, which is primarily concerned with histological data and those questions on which the anatomical picture may throw any light, may now be mentioned.

Disseminated sclerosis has been attributed to a variety of causes, some of which must be considered later, but, as has been stated previously, the etiology remains unexplained. A study of the cerebro-spinal fluid in disseminated sclerosis has as yet thrown little light on the disease, but investigations along this line have not been extensive. No culture has been obtained from the fluid, and such organisms as have been found in brain and cord sections must be regarded as having an accidental and not a causal relation to the disease. In the absence of any

specific organism the morbid changes have been attributed to the action of a toxin. This hypothetical toxin has not been isolated, but it is suggested that it forms either in the body, possibly in the course of an infective disease, or is brought there from outside of it. For the distribution of this infective agent we have three paths: the blood-vessels, the lymph-vessels, and the central canal of the spinal cord. In view of the importance of the lymphatics of the central nervous system in the distribution of infective agents, and the distinction, emphasised in numerous recent works, between hæmatogenous and lymphogenous infection of the central nervous system, the histological data which give any aid in understanding this problem of the path of infection will be considered. Amongst the further questions raised by this consideration will be the following: why and how the toxin becomes circumscribed and why, if it is carried by the blood-channel, it does not spread diffusely, but should act arbitrarily on detached smaller blood-vessels or a portion of the distribution of such a blood-vessel.

Further, clinically, the course of the disease is marked by remissions and exacerbations, and histologically we find in nearly every case chronic areas side by side with areas of a more acute process. Two questions arise: what relation have these more recent areas to the original pathological process; and, if related, is it that the injurious agent has remained in the body for years or is re-formed there, or is it that the original "noxa" lowered the vitality of certain portions of the nervous tissues, so that, later, other exciting factors overturned the balance of repair and waste and, in Weigert's sense (Wegfall von Wachstumhindernissen), disturbed the equilibrium between parenchyma and supporting tissue and removed the normal controlling influence which one tissue element of a complex structure normally exercises upon the other tissue elements?

Finally, in this connection must be mentioned one striking characteristic of the picture. Most observers who have had the opportunity of examining cases clinically and anatomically have noted the disparity between the anatomical change and the disturbance of function. From the days of Charcot onwards this has been related to the persistence of the axis-cylinder and the comparative integrity of the ganglion cells in a sclerosed patch, with the consequent absence of secondary degeneration.

(*To be continued on p.* 337.)

Abstracts

ANATOMY.

THE ARTERIES OF THE PONS AND MEDULLA OBLONGATA:
(399) **PART II.** J. S. B. STOPFORD, *Journ. of Anat. and Physiol.*, 1916, April, p. 255.

IN this portion of the investigation the precise blood supply of the pons and medulla was determined by injecting the vessels with soluble colours in gelatine, as recommended by Beevor in the case of the cerebral arteries.

1. The *anterior spinal* supplied—
   - (*a*) In the cord—
     - (1) Anterior and base of posterior cornua.
     - (2) Grey matter around central canal.
     - (3) White matter of ventral columns and region of anterior roots.
   - (*b*) In the medulla—
     - (1) Pyramids and pyramidal decussation.
     - (2) Medial lemniscus and tecto-spinal tract.
     - (3) Dorsal longitudinal bundle.
     - (4) Hypoglossal nucleus (except cephalically).
     - (5) Nucleus and tractus solitarius (at decussation).
     - (6) Gowers' tract (at decussation).
     - (7) Dorsal nucleus of vagus.
     - (8) Olivo-cerebellar fibres as they cross the middle line.
     - (9) The internal and ventral external arcuate fibres with nucleus.
2. The *vertebral* supplied—
   - (1) Few pyramidal fibres at formation of lateral cerebro-spinal tract.
   - (2) Pyramids at the lower border of pons, and a variable part of the lateral portion below.
   - (3) The whole of the ventral part, and the cephalic portion of the dorsal part, of the inferior olive.
   - (4) The dorsal accessory olive.
   - (5) Tegmento-olivary tract and olivo-cerebellar fibres in formatio reticularis.
   - (6) Generally the dorsal vago-glossopharyngeal nucleus above the calamus region.
   - (7) Most cephalic part of hypoglossal nucleus.
   - (8) Nucleus and tractus solitarius (at calamus).
   - (9) Nucleus and tractus spinalis nervi trigemini (at decussation).

3. The *posterior inferior cerebellar* supplied—
   (1) Spino-thalamic tract.
   (2) Rubro-spinal tract.
   (3) Olivo-cerebellar fibres as they passed to inferior cerebellar peduncle.
   (4) Dorsal vago-glossopharyngeal nucleus or their emerging fibres.
   (5) Nucleus ambiguus.
   (6) Nucleus and tractus spinalis of trigeminal nerve.
   (7) Ventral part of inferior cerebellar peduncle.
4. The *posterior spinal* supplied—
   (1) Funiculi and nuclei gracilis and cuneatus.
   (2) Caudal and more dorsal part of the inferior cerebellar peduncle.
   (3) Occasionally part of the descending root of vestibular nerve.
5. The *basilar* supplied—
   (*a*) *Medial set of pontine branches*—
      (1) Abducent and trochlear nuclei.
      (2) Oculo-motor nucleus (caudal part).
      (3) Medial longitudinal bundle.
      (4) Medial lemniscus.
      (5) Tecto-spinal and thalamo-olivary tracts.
      (6) Transverse pontine fibres.
      (7) Medial part of corpus trapezoidum.
   (*b*) *Transverse set of pontine branches*—
      (1) Brachium pontis.
      (2) Lateral part of corpus trapezoidum.
      (3) Superior olive and facial nucleus.
      (4) Remaining nuclei of eighth nerve.
      (5) Remaining nuclei of fifth nerve (including motor nucleus).

6. The *anterior inferior cerebellar* supplied a variable part of the most caudal portion of the brachium pontis and upper and dorso-lateral limits of the medulla.

7. The *superior cerebellar* supplied a variable part of the most cephalic portion of the brachium pontis (*cf. Review*, 1916, xiv., p. 155). AUTHOR'S ABSTRACT.

(400) **THE SENSORY FIELD OF THE FACIAL NERVE: A FURTHER CONTRIBUTION TO THE SYMPTOMATOLOGY OF THE GENICULATE GANGLION.** J. RAMSAY HUNT, *Brain*, 1915, xxxviii., p. 418 (9 figs.).

As this paper is based on the analysis and study of cases by the "herpes zoster method," the results cannot be accepted as the final solution of this difficult problem.

The facial nerve is to be regarded as a mixed cranial nerve, homologous with the trigeminal, glosso-pharyngeal, and vagal systems. In common with these, the facial possesses a definite group of symptoms and syndromes directly dependent upon involvement of its sensory system.

In the lower forms of life the sensory facial equals, and may even exceed in importance, the motor functions. In man, however, the conditions are reversed, the motor function is predominant, and its sensory system has retreated before the advance of the trigeminus in front and the cervical areas posteriorly.

In comparative anatomy the facial is the nerve of the first branchial or ear cleft, and evidences of this ancient phylogenetic relationship are still present in man, in the cutaneous remnant which persists on the external ear, as well as its relations to the other structures of the auditory mechanism which take their origin from the region of the spiracle or first visceral cleft.

That portion of the facial sensory system which still persists in man is concerned in the innervation of the internal ear, the middle ear, and its prolongations into the Eustachian tube and mastoid cells, and the skin on certain portions of the external ear. There is also evidence that a vestigial remnant occasionally participates in the innervation of a strip on the postero-mesial surface of the auricle, and within the buccal cavity in the chorda tympani distribution, and on the palate near the anterior pillar of the fauces.

The sensory system of the geniculate ganglion has the following symptomatology:—(*a*) Pain and sensory disturbances in facial neuritis; (*b*) neuralgic affections, primary tic douloureux, reflex otalgia, herpetic and tabetic otalgia; (*c*) a sensory pathway for the direct transmission of irritative impulses to the facial nucleus, thus favouring the production of facial twitchings and spasms; (*d*) herpetic inflammations of the geniculate ganglion, a *syndrome* characterised by an eruption of herpes zoster in the geniculate zone, usually associated with facial palsy and often with auditory symptoms.

The cutaneous zone of the geniculate ganglion is represented on one or more of the following landmarks of the external ear, viz., the concha, external meatus, tragus, anti-tragus, incisura intertragica, anti-helix, fossa of the anti-helix, superior portion of the external surface of the lobule within the auditory canal and on the tympanic membrane. This geniculate zone is variable in size and distribution in individual cases, and other sensory systems, *e.g.*, the fifth, ninth, tenth, and cervical nerves may also participate in this area.

The sensory disturbances following lesions of the facial nerve

in the Fallopian canal have the following characteristics:—The pain is situated in the depths of the ear and mastoid region and in the central portions of the external ear, sometimes extending in the direction of the throat and tonsil, when severe, irradiation may also occur in the trigeminal, occipital, and cervical areas. In some recent cases of facial palsy, and occasionally after geniculate inflammations, a hypæsthesia in the region of the concha is demonstrable. Rarely in seventh palsies a postero-mesial strip on the auricle is also hypæsthetic. The inconstancy and moderate degree of the sensory disturbances when present are dependent upon the rudimentary nature of the sensory field of the geniculate, its variations in size, and its interlacement with the auricular branches of neighbouring distributions. For these reasons the "herpes zoster method" furnishes the best clinical criteria of its possible extent and variation.

A. NINIAN BRUCE.

A STUDY OF THE INVOLUTIONAL CHANGES WHICH OCCUR
(401) **IN THE ADRENAL CORTEX DURING INFANCY.** R. W. LEWIS and A. M. PAPPENHEIMER, *Journ. Med. Research*, 1916, xxxiv., March, p. 81 (2 plates).

THE authors' studies afford no clue to the inner significance of the post-natal degeneration of the adrenal cortex. This degeneration is usually accomplished at the end of the second week, although individual degenerating cells are found for a long time after this.

There is no regeneration of cortical tissue during the first three years of life. The fibrous zone between medulla and cortex is formed simply by the collapse of the framework, and there does not appear to be a new formation of fibrous tissue. Individual cases may show either acceleration or retardation of the involuntary process. For the latter, syphilis is suggested as a possible cause. Neither prematurity nor inanition noticeably modify the course of involution. Injection, *e.g.*, pneumonia, seems to be associated with an increase in the width of the intact cortex.

A. NINIAN BRUCE.

PHYSIOLOGY.

REMARKS ON THE CAUSE AND NATURE OF THE CHANGES
(402) **WHICH OCCUR IN MUSCLE AFTER NERVE SECTION.** J. N. LANGLEY, *Lancet*, 1916, cxc., July 1, p. 6.

TWO theories have been put forward to account for the obvious fact that section of a nerve causes trophic—*i.e.*, nutritive—changes

in the muscle it supplies. One is that there are special nervous impulses affecting nutrition different from those causing contraction. This theory has received little support, because there is no independent evidence of the existence of such fibres. The other is that the maintenance of the nutritive condition of the muscle depends upon its contracting at intervals, and when these are prevented by section of the nerve it loses weight and decreases in irritability. The wasting of denervated muscle is thus spoken of as "disuse atrophy," and on this basis it is customary to induce contraction in paralysed muscles by stimulating them with condenser or galvanic currents.

Professor Langley finds that contraction of the muscles, neither for a short daily period nor for a long daily period, prevents the wasting of the muscles or the occurrence of sluggish contraction, and concludes that the term "disuse atrophy" is a misnomer.

He attributes the wasting to the fatigue resulting from the continuous fibrillation of the muscle fibres which sets in from about the fourth day after section of the nerve. As each fibre contracts many times a minute, the total expenditure of energy in the day must be considerable. The resulting atrophy is thus due to too great rather than to too little functional activity.

A. NINIAN BRUCE.

NOTE ON THE FUNCTION OF THE MEDULLARY NERVE (403) **SHEATH.** C. E. H. MILNER, *Lancet*, 1916, cxc., June 3, p. 1124.

THE author found that, in a case where the spinal accessory nerve was accidentally divided, and the corresponding trapezius muscle paralysed, the faradic reaction persisted until the eighth day. In four other cases of division of nerves it was noticed that, although the return of function had become established, the faradic reaction had not returned.

From these facts he believes that the medullary sheath acts as a conductor for the electric current, whilst its existence is unnecessary for the transmission of physiological impulses, which are dependent solely upon the continuity of the axis-cylinders. The period of time required for degeneration of the medullary sheath by the Marchi method is about eight days, and coincides with the time which elapsed before the trapezius failed to respond to faradism. Division of the axis-cylinders, thus, is sufficient to interrupt the passage of the physiological impulse, but the electrical impulse is interrupted only by complete degeneration of the medullary sheath.

A. NINIAN BRUCE.

HISTOLOGICAL MODIFICATIONS WHICH PITUITARY EX-
(404) **TRACT INDUCES IN THE THYROID GLAND.** (**Intorno alle modificazioni istologiche che l'estratto ipofisario induce sulla glandola tiroide.**) UGO PARDI, *Lo Sperimentale*, 1916, lxix., p. 843.

1. THE modifications which aqueous extracts of the whole pituitary induce in the thyroid are not specific, since they may be equally produced by extracts of spleen and of liver.

2. These modifications denote a condition of hypersecretion of the colloid substance, and not of hyposecretion.

A. NINIAN BRUCE.

PSYCHOLOGY.

THE PSYCHOLOGY OF RUMOUR. BERNARD HART, *Proc. Roy. Soc.*
(405) *Med.*, 1916, ix. (Sect. of Psychiat.), pp. 1-23.

RECENT history has furnished an overwhelming demonstration of the fallibility of human evidence. A witness's report of his experience, even when given conscientiously, is rarely a correct reproduction of actuality, and a proportion of the details are erroneous. These perversions are dependent upon forces of whose action the individual himself is mainly or entirely unconscious, and among those forces a prominent part is played by complexes.

Rumour, as distinct from evidence, is a social phenomenon; it is something which occurs in communities, and has particular properties owing to that very fact. Crowds are the soil in which rumours grow and thrive, but crowd psychology is not intrinsically different from individual, it is simply the psychology of an individual in a particular environment, to wit, the presence of other individuals of the same species. Non-rational thinking—the result of non-conscious complexes—is a frequent phenomenon of both individual and crowd thought, but it is more obvious and unrestrained in the crowd because the crowd presents conditions which are peculiarly favourable for the action of the herd instinct, and herd instinct is one of the cardinal factors responsible for the non-rational type of thought. War is probably the most intense of all possible stimuli to herd instinct, and therefore its action overwhelmingly dominates the mind, non-rational opinions are disseminated with prodigious ease, and the rational activities, with their capacity for cool criticism, are at a low ebb.

The kinds of rumours produced depend upon the nature of the complexes underlying them. Thus we have those directly connected with the threat to the Herd (rumours of invasion, spies, Germany's giant submarines, &c.); those associated with Wish

Fulfilment, such as the famous Russian rumour; and, finally, rumours due to widespread and fundamental complexes, such as the war baby rumour and the stories of atrocities.

The impulse and desire to communicate the latest rumour to others arises from the unconscious action of the self-assertion or grandiose complexes as well as from the prompting of the herd instinct.

The generic character frequently exhibited in rumour is closely allied to the similar character displayed in myths and sagas.

Sadistic complexes tend not only to produce rumours of atrocities, but to express themselves in action and to produce actual atrocities, especially with the removal of inhibitions found in a sacking army, and the more so when that army has been bred in traditions akin to those of the wolf-pack.

H. DE M. ALEXANDER.

PATHOLOGY.

SOME OBSERVATIONS ON THE REACTION OF THE PROTO-
(406) **PLASMIC PROLONGATIONS OF THE CELLS OF PURKINJE. (Alcune osservazioni sul potere di reazione dei prolungamenti protoplasmatici delle cellule del Purkinje.)** ASCANIO ARETINI, *Rassegna di Studi Psichiatrici*, 1916, vi., Marzo-Aprile, pp. 85-99 (11 figs.).

THE author describes and illustrates changes in the branching dendritic processes of the cells of Purkinje. These consist mostly of a swelling of these processes, which may even, in consequence, attain gigantic sizes and shapes.

These changes have no connection with those found in amaurotic family idiocy. A. NINIAN BRUCE.

A CASE OF GANGLIO-NEUROMA OF THE SYMPATHETIC.
(407) DAVID RUTHERFORD ADAMS, *Brit. Med. Journ.*, 1916, May 6, p. 650.

A WELL-DEVELOPED male child, aged 3 years, was admitted to hospital with symptoms of acute intestinal obstruction from intussusception. A hard, immovable mass was palpable in the right iliac and right hypochondriac regions. It was about the size and shape of a large orange, and a diagnosis of sarcoma or of tuberculous glands was made. A laparotomy showed that the mass was retroperitoneal, and situated along the right side of the bodies of the last four lumbar vertebræ. It was thought to be a periosteal sarcoma, and a wedge-shaped piece was removed for micro-

scopical examination. The child died next day. The tumour was then removed, and found to be capsulated and free from the kidneys and suprarenals.

"The great mass of the tumour was composed of nerve fibres supported in a fibrous tissue stroma. Both medullated and non-medullated nerve fibres were present. Large numbers of ganglion cells, similar to those of normal sympathetic ganglia, were seen in groups scattered throughout the growth. There were also many developmentally early ganglion cells, the so-called sympathoblasts. The growth was non-malignant, and there was no metastasis."

A. NINIAN BRUCE.

GLIOMA OF THE CEREBELLUM WITH METASTASES. F. M. (408) JACOB, *Journ. Med. Research*, 1916, xxxiv., March, p. 95.

A MAN, aged 28 years, suffered from headache of two years' duration, gradually becoming more severe. Dimness of vision then developed, followed by blindness. Later complete paralysis of both lower limbs resulted. A decompression operation was performed over the right parietal region, but was followed by an intradural abscess and death.

At the autopsy a large glioma of the cerebellum was found. It had extended into and obliterated the fourth ventricle, and occupied most of the central white matter of the cerebellum. Smaller masses of a similar character were distributed upon the ependyma of the lateral ventricle, the central canal of the spinal cord and the leptomeninges. All of these masses were very cellular, unencapsulated, infiltrating and, to all microscopic appearance, malignant in character. Gland-like and rosette structures were noted in many parts of the tumours. The masses in the ventricle were discrete and had a nodular papillomatous structure, but the pia mater of the cerebrum, cerebellum, and cord contained a patchy growth of the gliomatous tissue, extending over a considerable area, involving much of the surface of the brain and cord. No masses were found in any organs outside the cranial and spinal cavities.

In the literature the general opinion is expressed that gliomata of the brain do not metastasize in the ordinary way, and secondary growths outside the central nervous system are virtually unknown. They, thus, do not invade blood and lymph channels. The reason for this may be found in the fact, that glia cells are highly specialised and cannot grow when removed from their natural surroundings. Even though gliomata of the brain do not metastasize to other organs, many of them should be considered histologically malignant or, at least, locally malignant

on account of their power of infiltration, rapid rate of growth and embryonal character of the cells.

The distribution of the metastasis in this case show clearly that the spread was by way of the cerebro-spinal fluid.

A. NINIAN BRUCE.

CLINICAL NEUROLOGY.

THE MID-PLANTAR REFLEX. (Le réflexe médio-plantaire.) G. (409) GUILLAIN and J. A. BARRÉ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 516. CHAUFFARD, *ibid.*, p. 568.

GUILLAIN and Barré describe a reflex which is not mentioned in the text-books. Percussion of the mid-plantar region produces extension of the foot on the leg and flexion of the last four toes. Examination of the reflex may be made in the dorsal, kneeling, or best ventral position. Percussion should be made in the mid-plantar region between the anterior extremity of the calcaneum and the metatarsus. The reflex is obtained throughout this region, and also by percussion of the outer and inner edge of the foot. Of the two movements of which the reflex consists, the extension of the foot is a spinal reflex, while the flexion of the toes appears to be due to neuro-muscular stimulation.

The reflex is constantly present in all normal persons. The writers found it lost in tabes, lumbo-sacral radiculitis, sciatica, and infective or toxic neuritis. The loss of the reflex is a very early sign of tabes. In sciatic neuritis the mid-plantar reflex may be abolished while the tendo Achillis reflex is still present or only diminished. The reflex is also lost in a large number of cases of epilepsy. It is exaggerated in hemiplegia, spastic paraplegia, disseminated sclerosis, pyramidal lesions in general, and in special forms of irritative neuritis due to wounds received in war.

The two movements of the reflex may be dissociated, the extension of the foot or leg may be lost, while flexion of the toes is preserved.

The mid-plantar reflex is a spinal reflex, its centre being situated in the first two sacral segments. The reflex is of clinical importance in diagnosis of affections of the central and peripheral nervous system in the lumbo-sacral zone.

Chauffard records the following cases which confirm the value of this new reflex :—

1. Man, aged 62, suffering from diabetes. Knee jerks present, but both tendo Achillis jerks and mid-plantar reflexes lost.

2. Man, aged 36, with right hemiplegia. Reflexes in lower

limbs very exaggerated. Mid-plantar percussion causes a clonus, direct on the right, centro-lateral on the left.

3. Woman, aged 56, with typical tabes. Knee jerks present. Complete absence of tendo Achillis jerks and mid-plantar reflexes.

4. Man, aged 60. Syphilis untreated at 21. No clinical signs of tabes. Knee jerks present, but left tendo Achillis jerks and both mid-plantar reflexes lost.

Chauffard concludes that as a rule the tendo Achillis jerks and mid-plantar reflexes correspond and are lost at the same time.

J. D. ROLLESTON.

(410) **CLINICAL DISSOCIATION OF THE MODIFICATIONS IN THE TENDO ACHILLIS REFLEX AND MID-PLANTAR REFLEX. (Dissociation clinique des modifications du réflexe Achilléen et du réflexe médio-plantaire.)** G. GUILLAIN, J. A. BARRÉ, and A. STROHL, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 841.

SINCE their last communication the writers have seen several fresh cases of sciatic neuritis in which the mid-plantar reflex was lost, while the tendo Achillis reflex was normal or only diminished.

Four illustrative tracings are given. J. D. ROLLESTON.

(411) **ANKLE CLONUS, PYRAMIDAL CLONUS, AND NON-PYRAMIDAL CLONUS. (Les clonus du pied. Clonus pyramidal et clonus non-pyramidal.)** G. GUILLAIN and J. H. BARRÉ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 518.

THE writers describe two means for distinguishing true or pyramidal clonus from false or non-pyramidal clonus:—

1. When ankle clonus is investigated in the ordinary way, *i.e.*, in the dorsal decubitus with the leg half flexed on the thigh, in pyramidal clonus the gastrocnemius and soleus, though belonging to the same muscular mass with a single tendon, are not in the same state. The gastrocnemius is flaccid, while the soleus is strongly contracted. In non-pyramidal clonus, on the other hand, relaxation or contraction occurs simultaneously in these muscles.

2. When the patient is examined in the ventral decubitus, with the leg flexed at a right angle and the foot horizontal, pyramidal clonus is obtained at once by strongly flexing the foot, while non-pyramidal clonus, which can be obtained in the dorsal decubitus, cannot be elicited in the ventral decubitus.

J. D. ROLLESTON.

ON THE DIFFERENT BEHAVIOUR OF THE CUTANEOUS
(412) **PLANTAR REFLEX EXAMINED IN THE DORSAL AND VENTRAL POSITION IN CERTAIN CASES OF PYRAMIDAL LESIONS. (Sur la modalité réactionelle différente du réflexe cutané plantaire examiné en position dorsale et en position ventrale dans certains cas de lésions pyramidales.)** G. GUILLAIN and J. A. BARRÉ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 838.

SINCE their previous communication the writers have observed several other cases of inversion of the plantar reflex when the patient was examined in the ventral position, viz., acute encephalitis, cerebral compression or attrition, paraplegia from compression, and multilocular sclerosis. An explanation of the phenomenon is not forthcoming, but in none of the cases did the pyramidal lesions appear grave or irreparable.

J. D. ROLLESTON.

THE DIAGNOSTIC IMPORTANCE OF THE ANKLE JERK. H. B.
(413) CARLILL, *Journ. Roy. Naval Medical Service*, 1916, ii., p. 180.

CARLILL examined the ankle jerks of an entire ship's company with the following results:—Among 1,052 sailors who considered themselves in every way healthy, there was a total absence of one or both ankle jerks in 15 cases. The remaining 1,037 were normal. In 7 of the 15 cases there was sufficient evidence to justify the provisional diagnosis of early tabes.

Carlill also records illustrative cases of the abolition of the ankle jerks in myopathies, affections of the peripheral nerves, spinal nerve lesions, lesions of the posterior roots, lesions of the anterior lower cells, and other conditions.

J. D. ROLLESTON.

LAMINECTOMY WITH SIMPLE EXPOSURE OF THE SPINAL
(414) **CORD: ITS EFFECTS ON THE REFLEXES AND ON THE SYMPTOMS OF SPINAL DISEASE.** CHARLES A. ELSBERG and PEARCE BAILEY, *Jour. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1852.

THE free removal of spinous processes and laminæ with opening of the dura, in the absence of increased intradural pressure or a discoverable lesion, may be followed by a disappearance of normal cutaneous and tendon reflexes for a number of hours, or may be followed by the temporary return to the normal of pathologic effects.

The operation of laminectomy may have a profound effect in certain pathologic states of the spinal cord, and may so modify

or check the disease that a return to normal conditions is even possible.

On account of the relative safety of laminectomy in experienced hands, except in the region of the conus and cauda equina, and for the reasons stated above, exploratory operations should be done more often. A. NINIAN BRUCE.

HYDROMYELIA AND HYDROENCEPHALIA. ALFRED GORDON, (415) *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 411.

THE case is reported of a girl, aged 22 years, who when 10 years old had a fall with loss of consciousness. At the age of 12 the fingers of her left hand became spastic and contracted, her head was drawn forward, her gait was unsteady, and she complained of headache and dizziness. Recently, when examined, she complained of headache and vertigo, was somnolent, in a marked asthenic condition, and the entire left side was paretic and showed an increased knee jerk, clonus, and sign of Babinski. Superficial and deep sensations were normal over the entire body. She showed a marked nystagmus to the left, but not to the right side. Otherwise there was no involvement of any of the cranial nerves. Gradually a weakness of the right arm and leg developed, she lost control of her sphincters, and finally died from asthenia.

At the autopsy, besides the enormous dilatation of the central canal of the cord and of the ventricles of the brain, with extraordinary deformity of nervous tissue, there were also marked vascular changes, viz., thrombosis of the anterior spinal artery and of numerous small vessels within the cord and medulla. A certain degree of meningitis was also present in the vicinity of the peripheral thrombotic arteries.

The author is inclined to the view that the dilatation of the cerebral cavities and of the central canal of the cord, with almost total absence of the corpus callosum, points to a congenital malformation of the cerebro-spinal axis, and that the vascular disturbances are simply contributory. D. K. HENDERSON.

VERTEBRAL TRAUMA AND LESION OF THE LOWER END OF
(416) **THE SPINAL CORD. (Trauma vertebrale e lesione midollare inferiore.)** E. ROSSI, *Riv. ital. di Neurop., Psichiatr. ed Elettroter.*, 1916, ix., p. 203.

A WOMAN, aged 19, fell out of a window on to her back, and sustained the following lesions: Paralysis of all the muscles innervated by the anterior crural, obturator, and gluteal nerves, the collateral and posterior branches of the sacral plexus and both sciatic nerves, general anæsthesia of the lower limbs, anæsthetic

zones in the hypogastrium and hips anteriorly, and anæsthesia of the skin of the sacral region posteriorly.

The case was an example of paraplegia probably due to a diffuse spinal lesion extending from the second lumbar segment, with destruction of the spinal nuclei of the muscles of the lower limbs, to the third sacral segment, with destruction of the cells representing the spinal centres of micturition and defæcation.

J. D. ROLLESTON.

TABES DORSALIS: A PATHOLOGICAL AND CLINICAL STUDY
(417) **OF 250 CASES.** BALDWIN LUCKE, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 393.

A PURELY statistical study with tables.

The ratio between males and females was 8·5 to 1·0.

Owing to the fact that a history of syphilis has only been obtained in 56·4 per cent. of the cases, because the primary, secondary, and tertiary lesions have been slight, and because certain races are less prone than others, the author inclines to the view that tabes is caused by a special strain of the *Treponema pallidum*, which has a selective affinity for the central nervous system.

In 111 cases the average time elapsing between primary infection and onset of tabetic symptoms was 15·34 years. The average age at onset was 42·34 years.

In regard to the symptomatology, lancinating pains, somewhere in the body, were usually the predominating initial symptoms. Insanity, other than paresis, occurred in six cases, or 2·4 per cent. Romberg's sign was present in 96 per cent. of cases, absent knee jerks in 90 per cent., Argyll Robertson pupils in 80 per cent., sensory disturbances in 58 per cent., Charcot joints in 9·2 per cent., &c.

The average age at death was 54·96 years, or 8·01 years after the symptoms began.

D. K. HENDERSON.

PARALYSIS DURING PASTEUR ANTIRABIC TREATMENT,
(418) **WITH REPORTS OF SEVEN PERSONAL CASES, ONE TERMINATING FATALLY, AND SIX OTHER PREVIOUSLY UNREPORTED CASES.** FRANK S. FIELDER, *Journ. Amer. Med. Assoc*, 1916, lxvi., June 3, p. 1769.

PARALYSIS complicating the Pasteur antirabic treatment is very rare, but doubtless occurs in mild form more often than is known. It affects adults chiefly, young children almost never. The prognosis is good in cases of mild or moderate degree, but the mortality among the severe cases is high. The administration of

antirabic treatment is therefore not entirely devoid of risk. The possibility of the occurrence of paralysis in any particular case, however, is so slight that it should not deter those who evidently need antirabic treatment. A person bitten by a rabid animal is much more likely to develop rabies, which is certainly fatal, than paralysis, which usually ends in recovery. The slight risk of paralysis should always be explained to those who are inclined to insist on antirabic treatment in the absence of clinical or laboratory evidence that the biting animal was rabid. In most cases this paralysis is caused by the antirabic treatment itself (fixed virus infection, or toxin, or both). It is not often due to street virus infection modified by the treatment. Its incubation is shorter than that of most cases of street virus rabies. Variations in the strength of the fixed virus used are probably a factor in the etiology. Personal idiosyncrasy is an important predisposing condition.

A. NINIAN BRUCE.

THE CRANIAL DEFORMITY OF OXYCEPHALY; ITS OPER-
(419) **ATIVE TREATMENT, WITH A REPORT OF CASES.**
WILLIAM SHARPE, *Amer. Journ. Med. Sci.*, 1916, cli., June, p. 840.

CASES of cranial deformity of the oxycephalic type are fairly common, and are usually brought first to the ophthalmologist on account of the failing vision due to a secondary optic atrophy of varying degree. This is due to an early meningeal irritation, with the resultant premature closure of the sutures of the base and posterior portion of the skull; as the brain enlarges it tends, therefore, to protrude through the anterior fontanelle, and thus the characteristic cranial deformity is produced, and as the result of the increased intracranial pressure, a choked disc with the subsequent secondary optic atrophy occurs.

The treatment should be directed toward a relief of the increased intracranial pressure; in the cases of the turmschädel type of deformity of the skull there is usually no visual impairment, and the cranial deformity is slight because the intracranial pressure is not high; these cases do not require an operation.

In the oxycephalic type of cranial deformity, however, the increased intracranial pressure should not be allowed to produce the blindness of a secondary optic atrophy; an early relief of this increased pressure with the resulting avoidance not only of the cranial deformity, but of the far more important impairment of the vision, is advisable by means of the operation of cranial decompression. Of the cranial operations to be used, the subtemporal decompression is the operation of choice.

A. NINIAN BRUCE.

CEREBRAL RHEUMATISM. (Contribution à l'étude du rhumatisme
(420) **cérébral.)** S. COLOMBE, *Paris méd.*, 1916, vi., p. 499.

A MAN, aged 27, who had had numerous attacks of rheumatism since the age of 10, at the end of his last attack developed symptoms of meningitis. Salicylate intoxication and uræmia could be excluded. Three successive lumbar punctures gave issue to a somewhat turbid fluid containing polymorphs and lymphocytes, but no micro-organisms.

The patient was taken home when moribund by his family.

J. D. ROLLESTON.

BILATERAL AND COMPLETE TRIGEMINAL PARALYSIS
(421) **WITHOUT INVOLVEMENT OF OTHER CRANIAL NERVES.**
C. M. BYRNES, *Johns Hopkins Bull.*, 1916, xxvii., May, p. 138.

ON 19th January 1915, a man, aged 29 years, was admitted to the Johns Hopkins Hospital with a history of having contracted syphilis on 4th December 1914. On admission he showed well-marked secondary lesions. During January 1915 he received two intravenous injections of salvarsan, 0·6 gm., and then on account of business affairs had to leave the hospital. On 8th March 1915 he complained of ringing in both ears, severe headache, and later severe pain in the left side of the face "resembling facial neuralgia." On 14th March the entire left side of the face felt numb, and chewing on this side was difficult. On 20th March the right side of the face became numb, and it was almost impossible to masticate anything solid. The condition progressed, and within two days the entire front of the head and both sides of the face were completely numb: it was impossible to chew, or even close the jaws.

There was complete loss of tactile, pain, and thermic sense in the entire sensory area of both trigeminal nerves. Corneal sensibility was completely lost on both sides, and irritation of the nasal and buccal mucous membranes produced no response from either side. Sensibility of the tongue was lost on both sides anteriorly. The motor portion of each fifth nerve was completely paralysed, the muscles on both sides did not react to faradic stimulation, and reacted slowly to galvanism. None of the other cranial nerves were affected. The spinal fluid showed a cell count of 740 per cm., the globulin was increased, and a positive Wassermann was obtained both with the spinal fluid and blood serum.

In the course of eight weeks the patient was given five doses

of salvarsan intravenously, and four doses of mercurialised serum intradurally; a great improvement has taken place.

The difficulties of localising the lesion are emphasised, but "there is little doubt that the symptoms were due to intracranial involvement of both fifth nerves." D. K. HENDERSON.

THE SEQUEL TO A CASE OF EPIDEMIC CATARRHAL
(422) **JAUNDICE.** J. A. PROCTER and G. WARD, *Brit. Journ. Child. Dis.*, **1916, xiii., p. 164.**

A BOY, aged 12½ years, after an attack of epidemic catarrhal jaundice, developed extreme head retraction and became unconscious. Two days later the head retraction vanished, and the mind became clear, but some purpuric spots appeared on the flanks. Death took place two days later. *Necropsy*: Spinal cord and fluid normal. Brain and membranes normal except for slight congestion. "Hob-nail" cirrhosis of liver.

The attack of meningism when meningococcal meningitis was epidemic in the country is remarkable. J. D. ROLLESTON.

A CASE OF ATYPICAL MULTIPLE SCLEROSIS WITH BULBAR
(423) **PARALYSIS.** SIGMUND KRUMHOLZ, *Journ. Nerv. and Ment. Dis.*, **1916, xliii., May, p. 425.**

A GIRL, 18 years old, who since the age of 6 years has had an oto-sclerosis, and since the age of 13 years a spastic torticollis. Since July 1912, following a slight contusion, she has complained of a dull, continuous pain on the left side of the back of the neck. In May 1913 she experienced a neuralgic pain on the left side of the forehead, accompanied by hoarseness and by dry cough, which was soon followed by impairment of speech and voice, and difficulty in swallowing. When examined, her speech was found to be thick, indistinct, nasal in character, and her voice dysphonic. The left half of tongue was thinner than the right, presented corrugations and fibrillary twitchings, and was protruded to the left. The velum palati hung down lower on the left than on the right, and on phonation was not elevated. There was a paralysis of the left vocal chord. Linguals were pronounced indistinctly, but labials were pronounced well. There was no nystagmus; the eye-grounds were normal. There was exaggeration of the tendon reflexes, particularly on the right side, and an occasional sign of Babinski was obtained on the right side. The Wassermann reaction was negative.

In later examinations a horizontal nystagmus could be demonstrated. D. K. HENDERSON.

ON THE NERVOUS COMPLICATIONS OF WHOOPING-COUGH (MULTIPLE SCLEROSIS). (Contributo clinico allo studio delle complicazioni nervose della pertosse: (sclerosi multipla).) (424) G. ZAMBONI, *Riv. clin. di ped.*, 1915, xiii., p. 773.

ZAMBONI reviews the literature, and records the following personal case of multiple sclerosis. A girl, aged 5 years, developed pertussis in March 1908. The disease ran a regular course till July, and then the paroxysms became very violent, and were accompanied by hæmorrhages from the mouth and nose. In another three weeks psychical disturbance, scanning speech, and difficulty in walking were noted. On admission to hospital in November her condition was as follows: Mental condition normal for her age, but somewhat torpid, scanning speech, slight horizontal nystagmus, very slight paresis of the left lower facial, paretico-spastic gait, intention tremor, and very brisk knee jerks.

She remained in hospital for a month, and was treated with iodides without any effect on the nervous symptoms, though she gained a kilogramme in weight. J. D. ROLLESTON.

A CLINICAL AND PATHOLOGICAL CONTRIBUTION TO THE STUDY OF PONTINE TUMOURS. (Contributo clinico ed anatomo-patologico allo studio dei tumori del pons.) (425) G. MINGAZZINI, *Riv. di Patol. nerv. e ment.*, 1916, xxi., p. 289.

A MAN, aged 18, developed the following symptoms in the course of a few months. *First Stage.*—Mental dulness, headache, vertigo, vomiting, amblyopia (choked disc), epileptiform attacks exclusively confined to the limbs on the right side, increase of tension and of albumin in the cerebro-spinal fluid, bilateral paralysis of VI., paresis of VII. and of the body on the right side, bilateral dynamic ataxia, Romberg's sign, ill-marked corneal reflexes, pupillary reflexes sluggish (to light). *Second Stage.*—After slight improvement obtained by mercurial treatment, in addition to the symptoms described above, there were noted extension of the hallux and increased tendon reflexes on the right, and pain on percussion on both sides of the skull. In the *Third Stage*, which occurred shortly before death, the following symptoms supervened:—Loss of the pupillary reflexes, paresis of the limbs, and power to carry out only simple movements, paresis of XII. on the left and dysarthria, pain on pressure on the branches of V., loss of corneal reflexes, tendency to fall backwards and to the left, cerebellar asynergy, and adiadokinesis.

The necropsy showed a tuberculous mass which occupied all the region of the tegmentum. The pyramidal fibres of the pons were also involved to a great extent, especially on the left.

J. D. ROLLESTON.

SARCOMA OF FRONTAL LOBE GIVING RISE TO OCULAR SIGNS ONLY. (426) R. BEATSON HIRD, *Brit. Med. Journ.*, 1916, May 13, p. 678.

A BRICKLAYER, aged 34, complained of being kept awake at night by a pain in his right eye, giving rise to the sensation "that his eye was being pulled out." This had lasted about four months. The right eye then began to become prominent, and he was unable to open it properly. His head also became "muddled at times." The pupil reactions were normal in all respects. The right fundus showed marked optic neuritis with a fair degree of swelling, and some retinal hæmorrhages in the region of the disc. The left fundus showed early optic neuritis, with also a retinal hæmorrhage. The optic neuritis was of the increased pressure type. A radiograph showed nothing definite, and the nose and accessory sinuses were normal. The Wassermann test was negative. Death occurred from respiratory failure, being preceded for about forty-eight hours by mental peculiarity, *e.g.*, he got up during the night and wandered about the ward. There were never any general symptoms of intracranial trouble.

At the autopsy the meninges over the orbital surface of the right frontal lobe were found to be almost a quarter of an inch thick, the bone in the roof of the orbit and in the neighbourhood of the nasal sinuses was eroded, soft, and friable, and a tumour about the size of a Tangerine orange was found in the right frontal lobe. There was no capsule, the edge of the growth was ill-defined, and the swelling projected mesially and caused a considerable depression in the left frontal lobe. Microscopically it was a typical round-celled sarcoma. A. NINIAN BRUCE.

THE PITUITARY FOSSA AND THE SURGICAL METHODS OF APPROACH TO IT. (**Hunterian Lecture.**) (427) V. ZACHARY COPE, *Lancet*, 1916, March 18, p. 601 (4 figs.).

THE routes which may be utilised to reach the pituitary fossa, either directly through the cranium or indirectly through the facial skeleton, are as follows:—

Cranial.—1. Temporal—intradural (Horsley).
2. Temporal—extradural (Braun).
3. Frontal (Krause).
4. Fronto-orbital (Frazier).
5. Callosal puncture.

Facial.—1. Nasal—Septal resection (Schloffer, Hirsch, West, Cushing, Kanavel, Halstead, &c.).
2. Nasal—Ethmoid resection (Hirsch).
3. Paranasal (Chiari, Kahler).
4. Palatal (König, Preysing).
5. Maxillary.
6. Suprahyoid pharyngotomy.

Of these only four have been practised on a sufficient number of cases to merit special attention. These are Horsley's temporal method, Schloffer's coarse nasal operation, Hirsch and Cushing's submucous septal approach, and Frazier's fronto-orbital route. These are described here.

The mortality may be seen from the following statistics dealing with series of cases performed by various operators:—

Method.	Operator.	Number of Operations.		Mortality.
Schloffer's nasal method	V. Eiselberg	16	4	= 25 per cent.
Submucous septal -	Hirsch 26, Cushing 106	132	4, 8	12 = 9 „
Temporal route -	Horsley 10, Cushing 8	18	2, 0	2 = 11 „
Fronto-orbital -	Frazier 4, Cushing 16, Sargent 3	23	0, 1, 1	2 = 8·6 „
Paranasal - -	Kahler 7, Chiari 2	9	0, 0	0 = 0 „
Palatal - - -	Preysing	6	4	= 66 „

The author concludes that there are two operations which have proved fairly satisfactory for approaching the pituitary fossa, the Hirsch-Cushing submucous nasal method, and the fronto-orbital method of Frazier. In the great majority of cases the latter is the most suitable.

In the three cases he has himself operated upon successfully, the patients were almost blind before brought for operation. In the first case a portion of an endothelioma was removed, and the general condition improved, although the sight did not improve. The third case obtained great improvement of vision after a cyst was evacuated. The second case proved to be one of syphilitic meningitis, and no obvious improvement took place. The author recommends earlier operation for oncoming blindness due to pressure on the chiasma than is now the case, on account of the diminution of the mortality of the operation.

A. NINIAN BRUCE.

STUDIES ON THE PINEAL GLAND.—I. EXPERIMENTAL (428) **OBSERVATIONS. II. CLINICAL OBSERVATIONS.** GILBERT HORRAX, *Archives of Internal Med.*, 1916, xvii., May, pp. 607 and 627.

I. Experimental.—Out of 144 guinea-pigs, aged from 2 days to 6 or 7 weeks, complete pinealectomy was attempted in 82, and in the remainder merely a trephining over the pineal region. Over 60 per cent. of each group lived to maturity or until sacrificed.

Horrax's records are based on 15 males and 20 females, in which the fact of complete pinealectomy was proved by microscopical examination. Conclusions—(1) Total experimental pinealectomy is possible in guinea-pigs and rats (easier in rats); (2) pinealectomised male guinea-pigs show a hastened development of the sexual organs, manifested before puberty by a relative increase in size and weight, both of the testes and seminal vesicles, over control pigs of the same litter (the hypertrophy of the seminal vesicles has not previously been recorded); (3) histologically the testes and seminal vesicles of these animals, if taken before age of sexual maturity, show a more advanced physiological state than their controls; (4) the pinealectomised females appear to show a tendency to breed earlier than controls of the same age and weight; (5) for several reasons young rats are likely to prove better subjects for pinealectomy than young guinea-pigs, and some evidence of hastened maturity has been obtained in this species.

II. Clinical.—1. A girl of 11: precocious adolescence, menstruation, overgrowth, enormous appetite, adiposity, headaches, large breasts, pubic hair, thyroid isthmus palpable, optic discs pale, hydrocephalic skull, sella enlarged, shadow in region of pineal blood 6 per cent. eosinophils. Callosal puncture failed to do good. Patient still living, is mentally a child, but not backward in school-work.

2. Macrogenitosomia præcox in boy of 7½ years, with epilepsy. Genitals enlarged soon after birth; early dentition; voice of male type at 3½ years; pubic and axillary hair at 2 years; masturbation at 3½ years; epileptiform seizures at 3 years, turning of head to right. On admission, thyroid palpable, genitalia as large as adult's, second set of teeth complete, fundi slightly hyperæmic, nystagmus to right, voice deep, blood and urine normal. Disposition mischievous and troublesome. Increase of symptoms; operated on twice; examination of a section of his testis showed active adult type with hyperplasia of its interstitial cells.

3. Case of pineal tumour of rapid growth, regarded histologically as "struma of pineal gland." Boy of 12; two months ago nausea and vomiting, intermittent headaches, blurring of vision. Was very athletic. Voice deepened at 11 years. On admission, precocious adolescence, signs of intracranial lesion, and xanthochromia of cerebro-spinal fluid both by lumbar puncture and tapping of lateral ventricle. Sella normal. Blood eosinophils 9 per cent. Pigmentation; down on face. Mental maturity shown by thoughtfulness, &c. Diagnosis lay between intracranial tumour and tuberculous meningitis. The tumour was implanted on the third ventricle, and invaded the anterior lobe of the pituitary.

(This paper has 15 excellent figures and a bibliography of 138 references, conveniently arranged under headings.)

LEONARD J. KIDD.

HEREDITARY ANCHYLOSIS OF THE PROXIMAL PHALANGEAL JOINTS (SYMPHALANGISM). HARVEY CUSHING, *Genetics*, 1916, Jan., pp. 90-106 (7 figs. and 1 chart).
(429)

AN account is here given of an abnormal character, designated *symphalangism*, the result of incomplete prenatal development, which is transmissible by either sex, and appeared in seven generations as a bony ankylosis of the proximal interphalangeal joints of one or more fingers. In its milder degrees, the preaxial (radial) fingers are less likely to be involved than the postaxial. Both hands and feet of the affected individuals may be affected. The trait may be transmitted in its most outspoken form by a parent in whom it is inconspicuous, but never by unaffected parents.

Of 302 individuals in 72 completely recorded families, 25·8 per cent. of them were affected. Of the 150 children of the affected parents, 78 of them, or 52 per cent., were affected. Hence the trait behaves as a simple Mendelian dominant with an equal chance, among the offspring of affected individuals, that it will be or will not be inherited. A. NINIAN BRUCE.

THE ODOUR OF PAINT AS A CAUSE OF PLUMBISM. H. H. MOYLE, *Lancet*, 1916, May 27, p. 1083.
(430)

A MAN, his wife and child occupied a cottage of two living and two bedrooms, all small and poorly ventilated, and which had all been papered inside and thoroughly painted inside and outside with a cheap and poorly drying paint. The paint smelt very strongly and was rather sticky to the touch even eight weeks after painting.

The man and his wife both developed the ordinary symptoms of lead poisoning about eight weeks after the beginning of the painting, and as no cause for the poisoning could be detected it was thought to be "definitely due to the smell of paint only."

A. NINIAN BRUCE.

THREE CASES OF BERI-BERI. ROBERT A. FLEMING and H. J. C. GIBSON, *Edin. Med. Journ.*, 1916, xvii., July, p. 27.
(431)

THESE three cases all occurred in ship's firemen from Brazil, and appear to have been the only cases on board. Nervous symptoms were present. The authors consider the disease must be due to a toxin, and that it cannot simply be due to the non-existence in the diet of an element, without which a neuritis must inevitably occur. A. NINIAN BRUCE.

TRICHINOSIS AND THE CEREBRO-SPINAL FLUID. WILLIAM
(432) LINTZ, *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1856.
A CASE OF TRICHINOSIS WITH EMBRYO IN THE SPINAL
(433) **FLUID.** W. T. CUMMINS and G. R. CARSON, *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1856.

DR LINTZ found the *Trichina spiralis* in the cerebro-spinal fluid in three more cases. The patients were all Italians, and ate pork infected by the *Trichina spiralis* twenty-one days prior to the lumbar puncture. The cases developed into typical cases of trichinosis, showing the usual symptoms, including eosinophilia. In appearance the cerebro-spinal fluids appeared normal. They were clear and contained no sediment. Chemically only one failed to reduce Benedict's solution; all showed a faint trace of albumin, and no increased amount of globulin. On centrifuging them they showed only an occasional lymphocyte, and from one to four trichinæ per field. They were fairly motile.

The second paper records a case in a Greek, aged 39. Only one sluggishly motile embryo was found in the cerebro-spinal fluid by the fifth week of the disease. A. NINIAN BRUCE.

FACIAL NEURALGIA WITH PARALYSIS (PAINFUL FACIAL
(434) **PARALYSIS OF DIEULAFOY-TESTAZ) IN TERTIARY SYPHILIS. (La néuralgie paralysante de la face (paralysie douloureuse de la face, de Dieulafoy-Testaz) dans le période tertiaire de la syphilis.)** P. G. A. VERBECK, *Thèses de Paris*, 1915-1916, No. 63.

IN the course of syphilis, and especially during the tertiary period, there occurs a peculiar syndrome, characterised by (1) an extremely painful trigeminal neuralgia, and (2) a facial paralysis of peripheral type. The neuralgia always precedes the paralysis. The syndrome may coexist or be followed by other symptoms of nervous syphilis. It is rapidly cured by mercurial treatment, but is always a sign of a tertiary syphilis affecting the nervous system, and a prolonged treatment can alone save the patient from formidable complications. The condition is to be diagnosed from various syphilitic nervous affections, and from other facial neuralgias with paralysis, especially certain forms of zoster and diabetic neuritis (several cases of which appear to be really syphilitic). It does not appear to be due to neuritis or to compression of the trunk of VII. The symptoms, course, and pathological anatomy tend to show that in most cases it is due to radiculitis following chronic syphilitic meningitis, or to an intracranial syphiloma. The roots of V. and VII. are both affected by the same centre of specific inflammation. Surgical treatment

should be avoided, and antisyphilitic measures carried out. Injections of benzoate of mercury form the most advisable treatment.

The thesis contains the history of fourteen cases, one of which is original. J. D. ROLLESTON.

THE EFFECT OF FERRIVINE AND INTRAMINE ON SYPHILIS.
(435) L. W. HARRISON and C. H. MILLS, *Lancet*, 1916, June 17, p. 1214.

ACCORDING to M'Donagh (*v. Review*, 1916, xiv., p. 334) salvarsan does not act by virtue of its parasitotropic effect, but by directly increasing the amount of active oxygen in the serum of the host and so increasing his resistance. The active oxygen of the serum, however, can be increased directly by any strongly adsorbed metallic compound, such as one containing iron or aluminium in trivalent form. In M'Donagh's opinion it is not necessary to use such a toxic metal as arsenic; iron will do equally well. Ferrivine (tri-para-amino-benzene-ferric sulphonate) was thus introduced as a suitable compound which, being non-toxic, could be given in larger doses, and repeated at shorter intervals. Intramine (di-ortho-amino-thio-benzene), a sulphur compound, is used in the later stages as it increases the active oxygen in the serum indirectly.

The authors have carefully tested these two remedies on three well-marked cases of secondary syphilis and found that ferrivine entirely failed to cause *S. pallida* to disappear from the lesions. After the failure of ferrivine to cause the disappearance of *Spirochæta pallida* from a mucous patch, a single dose of 0·3 gm. salvarsan effected this in eighteen hours, and the patch, which had hitherto been uninfluenced, had healed within forty-eight hours. Clinically no influence could be detected of either or both these compounds on syphilitic lesions, although each of them was of the variety which heals in a week or ten days under salvarsan treatment. Further syphilitic lesions appeared immediately after the treatment in one of the two cases treated with both ferrivine and intramine. A mucous patch appeared on one tonsil as well as further syphilitic papules from which spirochætes were obtained. The other case developed nephritis, with albumin and epithelial casts, which were not present prior to the injections.

They conclude—(1) that intramine and ferrivine are extremely unpleasant in their effects, and (2) that they have no specific effect on early syphilis. A. NINIAN BRUCE.

FAINTING ATTACKS IN CHILDREN. R. HUTCHISON, *Brit. Journ*
(436) *Child. Dis.*, 1916, xiii., p. 161.

A RECORD of ten cases in children aged from 4 to 12 years. Seven were girls and three boys. The attacks lasted from a few minutes

to half an hour. The child became white and might fall down, but did not lose consciousness entirely. Hutchison excludes minor epilepsy and heart disease from the causation of these attacks, and thinks that the condition is primarily nervous in origin and "due to a temporary sympathetic paralysis leading to uncontrolled action of the autonomic system, with vaso-dilatation in the splanchnic area and inhibition of the heart." He suggests that liability to the attacks may be the consequence of defective suprarenal secretion resulting in a lowered sympathetic tone. Treatment consists in removal from school, change to the seaside, with strychnine as a tonic, and attention to the digestive organs.

J. D. ROLLESTON.

(437) **ABNORMAL RELATION BETWEEN LIVER AND BRAIN WEIGHTS IN FORTY-TWO CASES OF EPILEPSY.** D. A. THOM, *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 422.

THE data for this paper were collected from forty-two cases of clinically certain epilepsy which came to autopsy during the past two and a half years. The patients were well nourished, the terminal disease was of short duration, development was complete, and senile cases were discarded. At the time of death, most of the cases were between seventeen and forty-five years. The normal liver-brain ratio is 7—6. In 26 cases (62 per cent.) the brain was found to be heavier than the liver. In 8 cases the liver was normal, in 2 cases it was over-weight, and in 32 cases it was under-weight; in 14 cases the brain was normal, in 12 cases it was over-weight, and in 16 cases under-weight.

It is surmised that perhaps the epileptic convulsions are dependent on the pathological changes in the liver.

D. K. HENDERSON.

(438) **THE METABOLISM IN A CASE OF MYASTHENIA GRAVIS, WITH CONSIDERATIONS OF THE ADMINISTRATION OF CALCIUM AND OF GLANDULAR PREPARATIONS.** ARTHUR BOOKMAN and ALBERT A. EPSTEIN, *Amer. Journ. Med. Sci.*, 1916, cli., Feb., p. 267.

THIS case of myasthenia gravis presented, as unusual symptoms, bronzing of the skin with pigmentation of the buccal mucous membrane and high blood pressure.

The metabolism of calcium, magnesium, phosphorus, sulphur, and nitrogen and the ammonia excretion were studied with the patient at rest, while taking exercise, during the administration of epinephrin, of thymus gland, and of calcium, and presented no

abnormal features. The excretion of creatinin was below normal. There was at times a considerable excretion of creatin.

Ovarian and testicular substance were also administered. Neither the glandular preparations nor the calcium appeared to have any influence upon the clinical course of the disease.

A. NINIAN BRUCE.

THE MANAGEMENT OF THE SPEECH DEFECT PROBLEM IN
(439) **THE PUBLIC SCHOOLS.** WALTER B. SWIFT, *Educ. Administration and Supervision*, 1916, March.

THE management of the speech defect problem in the public schools demands a medical speech inspector to see all pupils and assign them to either a phonetic, stuttering, or a special class, and to have at the head of each of these divisions a teacher specially trained in one of these lines alone. AUTHOR'S ABSTRACT.

EXAMINATION OF VOICE DEFECTS FOLLOWING ADENOID
(440) **AND TONSIL OPERATIONS. STUDIES IN SPEECH DISORDER, NO. 4.** WALTER B. SWIFT, *Boston Med. and Surg. Journ.*, 1915, Nov. 18.

OPERATIONS for adenoids and tonsils often fail to relieve habits of faulty articulation and consequent school retardation. Vocal drill by one trained scientifically in speech disorder is the surest method to secure speedy permanent relief, in that perfect articulation that makes possible an easy enjoyable conversation.

AUTHOR'S ABSTRACT.

SOME DEVELOPMENTAL PSYCHOLOGY IN LOWER ANIMALS
(441) **AND IN MAN, AND ITS CONTRIBUTION TO CERTAIN THEORIES OF ADULT MENTAL TESTS.** WALTER B. SWIFT, *Amer. Journ. of Psychol.*, 1916, Jan.

I HAVE tried to show that all these related theories serve in the formulation of exhaustive tabulations of mental tests which should cover the *entire life* with all of its variations. Mental tests should relate all sensorial content, all interpretative reaction, all forms of collaboration, all controlled methods of expressive output according to the correlations laid down in the theory of the whole and the parts. It should be kept in mind that these are dominated in the different life periods by sense, affection, will, and intellect respectively, each of which is relegated in succession to its subordinate place. These should be related in such a way as to picture the past, present, and future of all possible mental types in their perfected development, and the percentage relationship should be shown between the present individual and his final, ultimate developmental perfection. AUTHOR'S ABSTRACT.

PSYCHIATRY.

DIET AS A FACTOR IN THE CAUSATION OF MENTAL DISEASE. CHAS. MERCIER, *Lancet*, 1916, March, pp. 510 and 561; *Journ. Mental Sci.*, 1916, lxii., July, p. 505.
(442)

THE symptoms in thirty-five cases of mental disorder are described, as well as the particular diet partaken of by each individual prior to treatment. The peculiarities in diet which preceded and accompanied the mental disorder in these patients were mainly of two kinds—deficiency of meat, or excess of fat, starch, or sugar. Recovery followed in 94 per cent. on the diet being rectified. Excess of fat caused headache with, in some cases, mental confusion. Deficiency of meat in the diet was accompanied by confusion of mind with depression (which in several cases led to the contemplation of suicide); screaming fits and motiveless weeping in several women; and defect of the "business" memory. Three cases exhibited hallucinations.

The author describes the methods of reasoning he adopted in arriving at the conclusion that the faulty diet in these cases was the cause of the mental disorder, and is of the opinion that in a certain number of cases of mental disease, small in proportion to the whole, but considerable in the aggregate, the disease is due to an error in diet, and can be cured by rectifying the error in diet.

H. DE M. ALEXANDER.

CATATONIA AS A TYPE OF MENTAL REACTION. DAVID K. HENDERSON, *Journ. Ment. Sci.*, 1916, lxii., July, p. 556.
(443)

THE diagnosis and differentiation of various forms of mental disorder by means of their symptomatology is apt to be misleading and inadequate. In order to obviate this, Meyer formulated his conception of reaction types whereby a psychosis is looked upon as a reaction to a situation, the type of the reaction and the final readjustment being largely dependent upon the characteristics of the individual. Hoch's studies of the personality in cases of dementia præcox and manic-depressive insanity have also come to be of great value in the interpretation of certain cases. In this paper seven cases of catatonia are described showing how dangerous it is to make cut-and-dry diagnoses, and how important and stimulating it is to study each case in relation to the life history of the individual. According to the former method there is no doubt that all of the cases reported would have been diagnosed as cases of catatonic dementia præcox, but, studied biologically, one sees that they are individuals of a particular type of make-up who have reacted to their difficulties in a certain way, but who finally have been able to make a good readjustment. AUTHOR'S ABSTRACT.

THE CAUSATION AND CURE OF CERTAIN FORMS OF LUNACY.
(444) RUPERT FARRANT, *Brit. Med. Journ.*, 1916, June 24, p. 882.

THE thyroid gland was frequently found to be abnormal in children, adolescent, and adult lunatics; its size varied from considerable enlargement to complete atrophy, and the general condition from one of hyperthyroidism and exophthalmic goitre to myxœdema and cretinism. The pituitary gland was found sometimes to have given rise to symptoms of hyperpituitarism to apituitarism, in idiocy, dementia præcox, and other forms of insanity. Enlargement and atrophy were deduced from X-ray photographs of the sella turcica and clinoid processes. Alteration was found in the size of the testicles associated with ductless gland changes. Testicular atrophy was well seen in cases of apituitarism. From the histories of cases it was deduced that the stimulation of the sexual organs or its sudden cessation was associated with altered mentality varying from mania to exhaustion psychosis; altered mentality may also be found in cases of double castration. Hypertrophy of the prostate was often found to be associated with altered mentality, and after complete removal cases were frequently associated with depression or melancholia.

Pyorrhœa and carious teeth were found to be a frequent accompaniment of lunacy in adults; in certain cases signs of chronic intestinal stasis and toxæmia were well marked. Streptococci in the fæces were found in 100 per cent. of cases, and *Bacillus coli* was totally absent in some cases of mania. Streptococci were also found from vaginal swabs of puerperal mania.

It is deduced that many cases of lunacy may be classified according to the toxæmia present, and the change that it has induced in the ductless glands. The effect of toxæmia varies with the intensity, duration, and age of the patient; the first effect is stimulation, the final fibrosis; in the fœtus and in childhood an acute or chronic toxæmia may induce atrophy of a ductless gland, and consequent maldevelopment and idiocy. Three groups stand out when the pituitary, pineal, or thyroid is atrophied. Cases of dementia præcox exhibit a polyglandular syndrome, and different gland types are to be found, and the appearance of the cases varies whether the gland is hypertrophic or atrophic.

Toxæmia, by altering the amount of secretion, induces an altered mental state, and this renders the patient insane, or liable to insanity from slight mental stress. Alteration in the sexual glands, whether primary or secondary leads to altered mentality up to insanity. A. NINIAN BRUCE.

Reviews

ANATOMY OF THE BRAIN AND SPINAL CORD, with special reference to mechanism and function. For students and practitioners. HARRIS E. SANTEE, A.M., M.D., Ph.D., Professor of Nervous Anatomy in Chicago College of Medicine and Surgery, &c. Fifth edition, revised and enlarged. Pp. xxxvi+474, with 158 illustrations, 46 of which are printed in colours. P. Blakiston's Son & Co., Philadelphia. Pr. $4.00 net.

(445)

IN this book an excellent and up-to-date description of the anatomy of the brain and spinal cord will be found. As far as possible the function of each part is described in connection with its anatomy. "The special objects held in view are the location of functional centres and the tracing of their afferent, associative, and efferent connections. Particular emphasis is laid upon the origin, course, termination, and function of conduction paths as they are met in the regular study, and the more important and better known of these paths are summed up in a final chapter on the tracing of impulses." The Basle nomenclature is used throughout, the English equivalents of the Latin terms being largely employed.

The book is divided into seven chapters. The first chapter commences with a full description of the meninges of the brain, the arterial supply, the venous supply, and the embryonic divisions. The descriptions are very complete and well illustrated. The second chapter discusses the development of the brain and the roots of the twelve cerebral nerves, and concludes with a number of interesting points on brain measurements and weight. The special chapter in the earlier editions on embryology is here dispensed with, the embryology being more fully interwoven with the regular text. The third chapter is very long, and is concerned with the whole of the cerebrum. Most of the illustrations are original, and are especially valuable in demonstrating the relations of the different structures in the region of the basal ganglia and lateral ventricles. A special section of this chapter is devoted to the structure of the grey and white matter of the cerebrum, both minute and general, the most recent work on cell-lamination and on the function of the basal ganglia being incorporated. The fourth chapter is devoted to the descriptive anatomy of the cerebellum, pons Varolii, medulla oblongata, and fourth ventricle. These are considered microscopically as well as macroscopically. The fifth chapter occupies only six pages, and describes the membranes of the spinal cord. In the sixth chapter the whole of the spinal cord is studied, grey matter, white matter, grouping

of nerve cells, ascending and descending tracts, functions of different groups of nerve fibres, and structure of the roots of the spinal nerves. The seventh and last chapter is specially devoted to the tracing of the paths along which nerve impulses pass, first along efferent or motor paths, and second, along afferent or sensory paths, including the olfactory, optic, auditory, and gustatory paths. Finally the tracing of reflex pathways comes up for consideration under the heading of spinal, cerebral, spino-cerebral, cerebro-spinal, and cerebellar reflexes. There is a subject index. No references to literature are given.

We should recommend this work not only to the student but also to the more advanced worker. The scheme here drawn up is well adapted for a careful systematic examination of the brain. It includes most of the recent contributions to our knowledge, both macroscopic and microscopic. It gives a good account of the structure and function of the different areas, the tracts associated with them, and the different pathways along which afferent and efferent nervous impulses travel. It is also of considerable value as a work of reference.

THE INVOLUNTARY NERVOUS SYSTEM. By W. H. GASKELL, (446) M.A., M.D., F.R.S. Monographs on Physiology, edited by E. H. Starling, M.D. Pp. ix+186, illustrated. Longmans, Green & Co., London and New York. 1916. Pr. 6s. net.

THIS is the first of a series of monographs intending to set forth recent advances in physiology which will be published under the editorship of Professor Starling. In these monographs the laudable attempt is going to be made of emphasising what is worth retaining in past work "so far as this is suggestive of the paths along which future research may be fruitful of results," and therefore it is not intended in any way to give an exhaustive account of previous work.

In the first chapter the history of the involuntary nervous system is discussed, and the question is asked whether its muscles can be classed into morphological groups as in the case of the muscles of the voluntary system, and whether the position of its receptor (sensory), connector, and excitor (motor) elements can be defined with precision. "This book is an attempt to do so, and to put the involuntary nervous system on the same footing as the voluntary system." Bichât's views in regard to the independence of the cerebro-spinal and sympathetic systems are discussed, and then the observations of Onodi, Beck, and of the author himself are detailed, showing that the sympathetic chain was originally a part of the central nervous system, that the

white rami communicantes was the only system of communication between the organic (sympathetic) and animalic (cerebro-spinal) nervous systems. It is then shown that none but medullated fibres enter into the posterior root ganglia, that consequently all the non-medullated fibres are efferent, none afferent, and that the so-called sympathetic system is not a complete central nervous system, but consists purely of excitor neurons. "Everything, therefore, points to the conclusion that the so-called sympathetic nervous system consists simply of masses of motor neurons to a special system of muscles which have left the central nervous system, but are still connected with it by connector fibres in the rami communicantes."

There are three main "outflows" of connector fibres, the thoracico-lumbar, the bulbo-sacral, and the mid-brain. Of these it is the thoracico-lumbar or sympathetic outflow which connects with all the excitor neurons of the sympathetic system.

In the next three chapters the characteristic motor functions of the nerve cells belonging to these different outflows are considered.

The sympathetic nerve cells supply the motor nerves to the muscles of the blood vessels all over the body, to the sweat glands, to all unstriped muscle under the skin, whether pilo-motor or not, to all unstriped muscle derived from the segmental duct, and to the sphincters of the intestine. The fallacy of believing that the vagus contains accelerator fibres is proved. "There is absolutely no evidence of any vaso-constrictor nerves in any of the other cranial nerves, or in connection with the thoracico-lumbar outflow of connector fibres." The action of adrenalin confirms the above conclusions, because adrenalin acts only on those tissues which are innervated by the sympathetic nervous system, and is absolutely ineffective on all tissues which are innervated by the nerve cells of the cranial or sacral outflows.

The bulbo-sacral outflow sends out motor fibres to the involuntary muscles of the alimentary canal and its derivatives, the vagus group being confined to the small intestine and its derivatives, and the pelvic group to the large intestine and its derivatives. It has been found that acetyl-choline, a substance derived from ergot, injected intravenously, produces the same effects as stimulation of the bulbo-sacral connector nerves, and picks out the specific musculature just as adrenalin picks out the sympathetic or vaso-dermal musculature. It is proposed to call this system, supplied by the bulbo-sacral outflow, the "enteral" system.

The mid-brain outflow includes the third, fourth, and fifth cranial nerves. In the roots of the third nerves especially there

are small medullated fibres which enter into the ciliary ganglion, and then from this ganglion the short ciliary nerves go to supply the sphincter muscle of the iris and the ciliary muscles with motor fibres. Here, then, in the ciliary ganglion is a system of motor neurons resembling those of the voluntary system, in that their axons are all medullated, although the muscles they supply are not striated.

In the three following chapters the inhibitory nerves are considered.

Contrary to the arrangement in the voluntary system, where there is no evidence of the existence of nerve cells among the anterior horn cells, which give rise to inhibitory fibres in the involuntary nervous system, the existence of inhibitory cells and fibres, as well as motor cells and fibres, must be accepted. The observations of Fano, Bottazzi, and Rozenzweig are discussed, and are held to definitely prove the existence in the heart of a system of unstriped muscles in addition to the striated muscle. The unstriped muscle is supplied with motor fibres from cells connected with the vagus outflow, and with inhibitory fibres from cells connected with the thoracico-lumbar outflow; the striated muscle is supplied *vice versa*. In higher vertebrates, in which the unstriped musculature disappears, the vagus cells would thus be left inhibitory to heart muscle, and the sympathetic cells motor to it. It is due to the different structure of heart muscle in certain animals that widely varying results have been obtained on stimulation of the vagus.

In connection with the blood vessels it is stated that there is no undisputed evidence for the existence of inhibitory nerve cells, although the existence of their motor cells is indisputable. It is then pointed out that the organ supplied by the blood vessels no doubt affects them through products of metabolism, and, therefore, it is possible that the main factor in regulating the blood supply to an organ is chemical rather than nervous. The vascular system, however, is regulated by the heart. Such a regulation is essentially of a nervous nature, and makes it probable that the vascular muscles, like other muscles of the involuntary system, possess inhibitory as well as motor nerves. Arguments for and against these views are examined in detail. Chapter VIII. contains a discussion of the rhythmic and peristaltic movements in the involuntary muscles of vertebrates, and it is shown that although muscle, especially the simple varieties, has the power by itself of contracting rhythmically, still it is dependent on its innervation for its orderly regulation.

Chapter IX. deals with the innervation of glandular structures, and the following conclusions are arrived at: (1) "The nerve

cells which supply secretory nerve fibres to purely epidermal glands, *e.g.*, sweat glands, all belong to the sympathetic system, and are connected to the central nervous system by the thoracico-lumbar outflow of connector nerves; (2) the nerve cells which supply secretory fibres to the purely endodermal glands, *e.g.*, gastric and pancreatic, all belong to the enteral system, and are connected with the central nervous system by the bulbar (vagus) outflow of connector nerves." As far as the kidneys are concerned there is no evidence that they are under the control of the nervous system at all. The activity of the kidney cells is determined by the chemical nature of the substances brought to them by the blood.

The last two chapters are taken up with a consideration of the connector neurons, and the phylogenetic origin of the sympathetic nervous system.

This book, in all respects, is a most stimulating and interesting one, and can be warmly recommended.

AN ELEMENTARY TEXT-BOOK OF PSYCHOLOGY. Specially arranged for teachers in training. W. H. SPIKES, B.A. Pp. 173. Blackie & Son, Ltd., London, Glasgow, and Bombay. 1916. Price 2s. 6d. net.

(447)

IN this book a brief and elementary account is given of the psychology of the child viewed from the educational standpoint. The modern curriculum tends to be largely a chaotic mass of material, usually of unsuitable quality and quantity, and in many cases prematurely introduced. It does not, therefore, appeal to the natural interests of the child. What is required is that a proper choice of subject-matter, both in regard to quality and quantity, be made, and that this be introduced at the right time in the child's life. A knowledge of the child's mental growth is necessary for this purpose. Instruction must create a definite capacity for apperception by making such an arrangement of the subject-matter that each step enables the child to understand the next, and prepare him to receive and assimilate the latter.

The aim of this book is to give a short account of the fundamental points in the psychology of the growth and development of the mind of the child which require to be known and understood by the teacher. The atmosphere is largely that of the Herbartian school. No attempt is made to break new ground. Young teachers and students in training ought undoubtedly to find much of interest in the book.

TORULA INFECTION IN MAN. A group of cases characterised by
(448) **chronic lesions of the central nervous system, with clinical symptoms suggestive of cerebral tumour, produced by an organism belonging to the Torula Group (*Torula histolytica*, N. Sp.).** JAMES L. STODDARD and ELLIOTT C. CUTLER, *Monographs of the Rockefeller Institute of Medical Research*, 1916, No. 6, Jan.

IN this monograph two cases, which so closely resembled cerebral tumour as to indicate decompression, are fully reported. Both cases eventually came to autopsy, and enormous numbers of organisms, closely resembling those of blastomycosis, were found. These cases then are of much value in regard to the problem of cerebral pseudo-tumour, and the relationships of the lower fungi forming the blastomycosis group. In regard to the latter question in the experimental work, pure cultures of three different organisms were used, one isolated from a human case of cutaneous blastomycosis, one from a human case of coccidioidal granuloma, and one from Dr Frothingham's case of torula infection in a horse. Attention is drawn to the fact that, both in the cases and in the experimental work, lesions were produced closely resembling tuberculosis, and only differentiated by the presence of the parasites. The authors are of opinion that many cases diagnosed as tuberculosis may be due to this organism, owing to the fact that the parasites are so small they may be overlooked, and furthermore, in the latter stages of the lesion they may disappear entirely.

In a historical review of the subject evidence is put forward to show that coccidioidal granuloma is distinct from other diseases called blastomycosis, the previous attempts to classify the blastomycoses are detailed, and finally, ten cases of systemic blastomycosis with brain lesions are abstracted from the literature. In the discussion of these ten cases it is pointed out that all but four had either skin or subcutaneous tissue lesions, and presented in every way the usual picture of blastomycotic infection; the brain involvement was simply part of a general infection, and clinically was unimportant.

In the remaining four cases, however, there were no skin or subcutaneous tissue lesions, and all had brain lesions of such a nature as to cause the predominating symptoms throughout the disease. Tuberculous meningitis had been diagnosed in two of those cases, and senile dementia and general paralysis (tabetic type) in the other two respectively. The pathological lesions in these four cases consisted of the production in the brain substance of a gelatinous, homogeneous substance in which the organisms were embedded, and meningeal reactions occurred of varying severity. Sections of Frothingham's case were then examined,

experiments were performed on rats with a pure culture of the torula organism, and lesions were obtained identical with the brain lesions in these four cases, thus showing that these are probably true cases of torula infection.

The cases which are the basis for this monograph are as follows:—

Case I.—A married woman, 42 years, who had come of a healthy stock, and had developed normally, on 15th May 1914 complained of a persistent, throbbing headache, accompanied for two weeks by a temperature ranging between 98° and 102° F. Vomiting, poor vision, diplopia, dizziness, and a staggering gait, difficulty in finding words, and mental dulness all developed subsequently. She was in a dull, disoriented mental condition. There was suboccipital tenderness, questionable anæmia, marked choked disc, occasional inequality of the pupils, partial weakness of left abducens, marked dysarthria, deviation in gait to the left with uncertainty, no obtainable superficial and deep reflexes. Kernig's sign was negative.

On 15th August a right subtemporal decompression was done; the patient died on 27th August. From 11th August to 26th August the white blood count had varied from 14,000 to 25,000.

At autopsy there was found to be slight internal hydrocephalus, with occlusion of the aqueduct of Sylvius, thus giving rise to symptoms of increased intracranial pressure. Subacute or chronic meningo-encephalitis, with multiple foci of infection in the cerebellum, cerebral cortex, and basal ganglia. The changes in the organs showed nothing remarkable. The microscopical examination showed in general a chronic lepto-meningitis consisting of the accumulation of lymphoid, large phagocytic, mononuclear, giant, and rarely polymorphonuclear cells, with formation of connective tissue, especially about blood vessels, and with occasional caseous areas over the cerebrum, cerebellum, and spinal cord. Enormous numbers of spherical organisms of varying size, with a definite wall, intra- and extra-cellular, were present everywhere in the lesions. There were areas of necrosis, but no circumscribed tubercles. There were perivascular lesions resembling the meningeal lesions, and another lesion was a small spherical space in the cerebral tissue filled with a non-staining matter, in which were embedded large spherical organisms which were occasionally seen budding. The more general reactions consisted of a cortical gliosis, and a diffuse degeneration of ganglion cells and myelin sheaths.

Case II.—A man, 39 years, in March 1914 had an acute middle ear which was opened and drained with good result. In the latter part of September 1914 pain returned in the right ear, which was

again opened, and a small amount of pus was obtained. In the following week there was frontal headache with a temperature of 102°. Three days later a right hemiplegia developed, affecting principally the arm. Drowsiness was a prominent symptom. Lumbar puncture showed 57 cells per c.mm., the Noguchi test was positive, Wassermann was negative, the gold chloride test was positive for tumour or tuberculosis. Cultures of the fluid were negative, and a guinea-pig inoculated with the fluid gave negative results. The eye-grounds were at first negative, but later showed an early choked disc without measurable swelling. A left subtemporal decompression was done, but the patient ultimately died six weeks later. The brain was cut into parallel frontal sections 3 to 6 mm. thick. At the lower extremity of the left internal capsule there was a lesion 4 by 2 by 3 mm. antero-posteriorly, yellow, soft, with loss of substance. Lesions were also found in the left globus pallidus, and in the right lenticular nucleus. In the left upper part of the cerebellum there was an area of purulent infiltration. This lesion extended into the cerebellar tissue, and closely resembled tuberculosis. A smaller soft mass was found in the right upper posterior portion of the cerebellum.

The microscopic changes, in the main, were the same as those enumerated in Case I., and large numbers of organisms were seen corresponding to those seen in Case I., and undoubtedly belonging to the torula group.

To confirm the above cases as being due to torula infection, an interesting account is given of experimental work on animals, of agglutination experiments, and of the cultural characteristics of torula. There is a final discussion and summary, a good bibliography, and a splendid series of plates.

THE BASIS OF SYMPTOMS. The principles of clinical pathology.
(449) **LUDOLPH KREHL. Authorised translation from the seventh German edition by Arthur Frederic Beifeld, Ph.B., M.D. With an introduction by A. W. Hewlett, M.D. Third American edition. Pp. xviii+517. J. B. Lippincott Company, Philadelphia and London. 1916. Pr. 21s. net.**

THE tendency of the Virchow Teaching was to associate each disease with a definite local pathology and to acknowledge no generalised conditions. More recent work, however, has taught us that the body consists really of a vast number of finely adjusted mechanisms which fit into each other with a marvellous accuracy, and that a disturbance in the function of one organ or system immediately produces changes in other organs and systems as the result of the necessity of their adapting themselves to the new

and altered conditions. These changes are not in themselves pathological. Pathology is, in fact, only the normal under peculiar conditions called morbid, and pathological processes include two essentially different types of events. These two types may be illustrated by sublimate nephritis and hypertrophy of the left ventricle following aortic valvular disease. The former is directly dependent upon the morbid factor itself, and is the result of a direct injury to the renal epithelium by an irritant. The latter is a response of the cardiac muscle to the valvular defect, and is a reaction or effort on the part of the organism towards healing; it is thus *per se* not pathological. Such changes create numerous problems in abnormal physiology which recent advances in physiology, as well as in physics and chemistry, have done so much to advance and to solve. After all, to obtain a proper understanding of the circulation and its disturbances, the mechanical point of view must be adopted. The digestion must be regarded from a chemical or physico-chemical standpoint, &c. Our knowledge on these subjects is gained both in the laboratory and at the bedside, but as these two sets of observers often work independently of one another, it takes time before the results of the one are fully appreciated by the other. The numerous important discoveries in the laboratory constantly tend to run ahead of the clinics, and in the complexity of the problems and the interest of the purely scientific side, the tendency often is for the practical application of the results to diagnosis and treatment to be lost sight of. It is thus of good service to have a book presented to us which helps to correlate these two important branches of medicine. The author emphasises the fact that he considers his book supplementary to text-books on physiology and pathological anatomy, and as an attempt to apply to the practical understanding of disease facts learned from these sources. It is essentially a work upon the understanding of disease as a disturbance of function and the necessity of thinking in terms of abnormal physiology, instead of allowing oneself to centre one's views too much upon structural changes. The different systems are discussed in turn, the last chapter being devoted to the nervous system. Each chapter is accompanied by an extensive bibliography.

That this work should have reached a third English translation is an indication of its usefulness. It contains, in addition to what has appeared in earlier editions, much of the recent work on cardiac arrhythmias, leukæmias and pseudo-leukæmias, anaphylaxis, complement fixation, chemotherapy, gastric secretion and motility, renal functional tests, and the rôle of the incoagulable nitrogen. A new chapter has also been added on constitutional diseases and diatheses.

MENTALLY DEFICIENT CHILDREN. Their treatment and
(450) **training.** G. E. SHUTTLEWORTH, B.A., M.D., &c., and W. A. POTTS, M.A., M.D., &c. Fourth edition. Pp. xix + 284, with 20 plates and 8 figs. in text. H. K. Lewis & Co., Ltd., London. 1916. Pr. 7s. 6d. net.

THE special feature of this book is the large amount of attention devoted to the legislative aspect of the problem of mental deficiency. The importance of this subject was brought prominently into notice by the Report of the Royal Commission published in 1908, which resulted in the enactment of the Mental Deficiency Acts for England and Wales, and for Scotland, and the amendment of the Elementary Education (Defective and Epileptic Children) Act. A short account is given of the principal provisions and subsequent administrative and educational changes thus produced. It is most unfortunate that the War should have unavoidably postponed the carrying out of these much-needed reforms. The number of cases in need of provision is large, and the accommodation so far available is quite inadequate, while the rapid increase in the number of mental defectives is bringing the problem still more urgently before the public notice.

The medical examination of mentally defective children under the regulations of the Board of Education is carefully considered, and a copy of the "Model Arrangements" issued by the Board of Education circular is appended. With regard to the Binet-Simon tests the authors agree with Dr Fernald's attitude that "the determination of mental defect cannot be made by automatic application of any method and scale."

The after care of these cases is now being also considered, and a Central Association for the Care of the Mentally Defective has been established, and done good work. A list of the certified institutions in England and Wales, of institutions for Poor Law cases, of certified houses and approved homes, of institutions for imbeciles and the feeble-minded under the Metropolitan Asylums Board, and institutions in Scotland, is given in an appendix, as well as a copy of the medical certificate required by the Mental Deficiency Act.

The more purely clinical aspect of the problem is not dealt with at great length, but one chapter is devoted to the pathological classification of forms of mental deficiency, and another to etiology, diagnosis, and prognosis. In another chapter the psychopathies of puberty and adolescence are considered. These are closely connected with states of congenital unfitness, and consist chiefly of juvenile general paralysis of the insane, dementia præcox, developmental epilepsy, and epileptic mental degeneration, pubertal perversion of moral sense and insanity in children. Separate

chapters are also devoted to educational training, industrial training, and moral training. Castration is not recommended. The experience of institutions for training youthful defectives both in this country and in America tends to show that a considerable proportion can be taught to conform to moral and social law, and rendered capable of order.

This book deals with mental defectives as a class rather than with the individual; it can be fully recommended to anyone wishing to understand the present attitude of those in this country who have studied the question.

LINKS IN A CHAIN OF RESEARCH ON SYPHILIS (OXIDATION AND REDUCTION). Being the Hunterian Lectures delivered before the Royal College of Surgeons, March 1916. J. E. R. M'DONAGH, F.R.C.S. Pp. 206. Harrison & Sons, London. 1916. Pr. 5s. net.

(451)

No one will dispute the fact that our knowledge of syphilis is in its infancy. The life history of the *Spirochæta pallida* is unknown, the Wassermann reaction is not fully understood, and the action of salvarsan requires much further work.

According to Mr M'Donagh the cause of syphilis is a protozoon belonging to the order *Coccidiidea*, and the species which most befits it is the *Leucocytozoon*; hence he calls it the *Leucocytozoon syphilidis*. The *Spirochæta pallida* is the adult male phase, and may be chemically recognised by its powerful reducing action, which appears to be due to its containing an unsaturated fatty acid in its molecule. This unsaturated fatty acid renders the permeability and adsorptive powers of its "membrane" very sensitive, with the result that it is readily stained with silver, and easily killed by therapeutic means which are metallic in nature, in virtue of the positive charge of its ions. The reducing action is due to the presence of active hydrogen. The biochemistry of the various phases of this life cycle and of syphilitic tissues are worked out, and it is concluded that the action of salvarsan is due to its directly increasing the amount of active oxygen in the serum of the host and so increasing his resistance—an indirect and not a direct action on the parasite. This active oxygen, however, may be still better increased directly by administering any strongly adsorbed metallic compound, such as one containing iron or aluminium in trivalent form, *e.g.*, "ferrivine" or "aluvine." At a later stage intramine, a sulphur compound, is proposed as it increases the active oxygen in the serum indirectly. The numerous problems of chemotherapy involved in the above results are described at length, a new test for syphilis is suggested

(the "emulsoid-suspensoid" test) and the Wassermann reaction and anaphylaxis all brought into line.

Much of this work is of a highly speculative nature. The author's reasoning is complicated and difficult to follow and to understand. Much of it has already been the cause of controversy and further work is required before it can be accepted.

STAMMERING and successful control in speech and action. EDWIN (452) L. ASH, M.D. Pp. 116. Mills & Boon, Ltd., London. 1916. Price 2s. 6d. net.

THIS small book is intended to be a practical guide for the assistance of those who suffer from stammering, and from various other tricks of voice and manner. The indications and rules given are based upon a systematic building up of general self-control, and no encouragement is given to methods that profess to banish such troubles without effort on the part of the individual concerned. Exercises and instructions are arranged throughout so that the book can be used by anyone wishing to cure himself, as well as being of assistance to those who have to treat such disorders.

It opens with a little essay on self-control, then gives a brief description of the results of loss of proper control as shown by confusion of speech, and other tricks of speech and manner. This is followed by a short account of the mechanism of speech, the causes of stammering, the foundations of successful control and its reinforcement by looking glass drill. A short chapter is also included on some famous stammerers. The rules and exercises are well planned. Stress is laid on *understanding* as a most important condition of recovery. "One of the first things the stammerer has to do is to make himself thoroughly familiar with reading aloud, singing, chanting, or speaking in a false voice. These things may be tried in turn, or used alternately to vary the monotony. But the object to be attained is familiarity with a flow of spoken words in one form or another." "The more the stammerer understands his trouble, the more readily will he be able to conquer it." The author is not very optimistic about the practical value of the psychoanalytic theory of stammering, which he expresses as follows: "A man stammers because he has something on his mind which he wishes to conceal; his impediment being the expression of his thought that he must hide this matter lest he be betrayed into 'giving himself away,'" "or stammering very often represents the unspoken wish of a naturally shy person to efface himself."

NERVOUS DISORDERS OF MODERN LIFE. Their prevention and cure. ROBERTSON WALLACE, M.B., C.M. Pp. 176. George Newnes, Ltd., London. 1916. Price 2s. 6d. net.
(453)

THIS is a small book which has been prepared purely for the layman, and which is designed to give him in popular form an easily understood exposition of the functions, care, ailments, and treatment of the nervous system. It is couched in very simple and non-technical language, and gives much good common-sense advice, *e.g.*, the preventive value of alternative occupations, the necessity for exercise, the meaning of fatigue and how to avoid it, &c. The commoner nervous ailments are described, with remarks on their treatment. The book seems fitted for the purpose for which it is written.

BOOKS AND PAMPHLETS RECEIVED.

Gaskell, W. H. "The Involuntary Nervous System." Longmans, Green & Co., London. Pr. 6s. net.

Healy, Wm. "Further Development of a System for recording Data concerning Criminals" (Second Report of Committee A, American Institute of Criminal Law and Criminology, 1913, April).

Healy, Wm., and Bronner, A. F. "An Outline for Institutional Education and Treatment of Young Offenders" (*Journ. Educ. Psychol.*, 1915, May).

Hunt, J. Ramsay. "A Case of Unilateral Ascending Paralysis" (*Boston Med. and Surg. Journ.*, 1915, clxxiii., Sept. 30, and *ibid.*, 1915, clxxiii., Oct. 7).

Kelynack, T. N. "The Drink Problem of To-day," in its medico-sociological aspects. Pp. 318. Methuen & Co., Ltd., London. 1916. Pr. 7s. 6d. net.

Morton, E. R., and Cumberbatch, E. P. "Essentials of Medical Electricity." Henry Kimpton, London. 1916.

Santee, Harris E. "Anatomy of the Brain and Spinal Cord." P. Blakiston's Son & Co., Philadelphia. 1916.

Stewart, Purves, and Evans, Arthur. "Nerve Injuries and their Treatment." Pp. 208. Henry Frowde and Hodder & Stoughton, London. 1916. Pr. 8s. 6d. net.

Wallace, Robertson. "Nervous Disorders of Modern Life: their Nature, Prevention, and Cure." George Newnes, London. Pr. 2s. 6d. net.

Zinsser, Hans, Hopkins, J. G., and Ottenberg, Reuben. "A Laboratory Course in Serum Study." Pp. xiii + 184. The Macmillan Co., New York. Pr. 5s. 6d. net.

Review
of
Neurology and Psychiatry

Original Articles

THE HISTOLOGY OF DISSEMINATED SCLEROSIS.

By JAMES W. DAWSON, M.D.

WITH A

PRELIMINARY COMMUNICATION

By the late ALEXANDER BRUCE, M.D., LL.D., and JAMES W. DAWSON, M.D.

II.

HISTORICAL.

THE lesions in disseminated sclerosis were figured by Cruveilhier in his *Atlas d'anatomie pathologique* (1835-1842), and the condition was first clinically described by Frerichs (1849). Rindfleish (1863) carefully examined the morbid anatomy: both Cruveilhier and he representing the lesions under the name "grey degeneration." The disease, however, was not generally recognised until Charcot published his famous lectures (1866). Charcot, working at the Salpêtrière, may be said to have given the classical account of the disease, both in its clinical manifestations and its anatomical features. The three cardinal symptoms — intention tremors, nystagmus, and scanning speech,—when present, were considered as diagnostic of disseminated sclerosis, and what may be regarded as the three cardinal and essential points of the anatomical picture

—absence of myelin sheath, neuroglia proliferation, and persistence of the axis cylinders—were no less certainly thought to be distinctive of this disease. It has been named by the French writers "sclérose en plaques disséminées," by the Germans "Herdsklerose," and the appropriate and expressive term "insular sclerosis" was proposed by Moxon.

Since the time of Charcot, however, it has come to be recognised that the essential clinical features are the grouping of certain symptoms and their variability. Pathologically, too, it is now recognised that the anatomical features, once thought to be distinctive of disseminated sclerosis, may be the final stage of quite different processes. In the Introduction it has been stated that the two groups of theories put forward to explain the nature of the morbid process may be classified as Exogenous and Endogenous. As the latter term has come to bear a wider significance than that first attributed to it, it has been thought advisable to refer to it under the name "Developmental." The term "exogenous" must be admitted to be synonymous with "inflammatory," using this word in its widest sense, as a reaction process.

In the following survey of the literature, the writers will be referred to under the following groups: those who support the inflammatory nature of the process, those who support its developmental nature, and a final group including the more recent investigators. It will be sufficiently evident that the views of many recent workers cannot be precisely defined.

Classification:—

(1) Inflammatory nature of the process:—
- A. Primary change in the neuroglia.
- B. Primary change in the parenchyma.
- C. Primary change in the blood-vessels.
- D. Disturbances in the lymph circulation.

(2) Developmental nature of the process:—
- A. Deficient "Anlage" of the nerve elements.
- B. Multiple gliosis.

(3) More recent researches, 1903-1913.

(1) Inflammatory Nature of the Process.

The views as to the inflammatory nature of the process are related to considerations regarding primary changes in the glia,

the true nervous elements, and the blood-vessels. The final etiological factor or factors which bring the primary change into operation have, as yet, received no satisfactory explanation, but it is agreed that the postulated virus circulates in the blood-vessels or lymphatics, and exerts its action primarily on the glia, the myelin sheath of the nerve fibre, or the blood-vessel wall itself.

A. *Primary Change in the Glia.*

According to the writers who support this view, the morbid process starts in a formative irritation of the glia, comparable to a chronic interstitial inflammation in other organs, *e.g.*, liver or kidney. The thickening of the glia reticulum and the formation of the glia fibrils strangle, as it were, the myelin sheath of the nerve fibres, which gradually diminish in volume and then disappear, leaving the axis cylinders persisting for a long time.

Charcot (1866) and his followers held firmly to this view: they regarded the changes in the nerve fibres as secondary to the glia proliferation, and the changes in the blood-vessels as a much later and not an essential part of the process. Charcot looked upon the neuroglia as a reticulated connective tissue, the meshes of which contained one or more nerve fibres. In the grey matter the meshes were much smaller than in the white, and in both the network served as a framework for the blood-vessels. At the nodal points of the reticulum were situated the neuroglia nuclei with a thin layer of protoplasm and numerous processes of different lengths. These processes seemed to unite with the trabeculæ of the reticulum, which continue them, as it were, without any line of demarcation. In his description of the topographical distribution of the areas he noted the frequent peri-ventricular localisation, that the spinal and cranial nerve roots were frequently affected, and that the dorsal sections of the medulla oblongata, where the cranial nuclei lie, show special predisposition to the development of plaques. He remarks, however, that they are rarely found in the grey substance of the convolutions. Regarding the macroscopic characters of the areas, Charcot noted that they were sometimes turgescent, sometimes on a level with the surrounding parts, and sometimes depressed, of a firm consistence, and circumscribed. In colour they resemble the grey matter,

with numerous vessels distributed through them, and on contact with the atmosphere they assume a rosy hue.

Microscopically Charcot showed that the apparently definite line of demarcation of a patch was an illusion. He distinguished three concentric zones in which, from the periphery inwards, the changes increased in intensity:—(*a*) A peripheral zone with thickening of the glia reticulum and increase in size and number of the glia nuclei; diminution in volume of the myelin sheath; and unaltered axis cylinders: (*b*) a transition zone in which the glia reticulum is still more hypertrophied and in places replaced by bundles of long and slender fibrils, which are disposed in a direction parallel to the long axis of the nerve fibres; the nerve tubes are still more atrophied and often represented by the axis cylinders, which may be very enlarged: (*c*) a central zone with the most marked changes. Here all traces of a reticulum have disappeared; the glia nuclei are shrunken, and may form groups between the closely arranged bundles of fibrils. In the midst of the fibrils persisting axis cylinders are present: these on longitudinal section are thicker than the glia fibrils and never rarified. This long persistence of the axis cylinders was looked upon as one of the characteristics of disseminated sclerosis, and Charcot ascribed to this fact the absence of secondary degeneration. He so emphasised this finding as to make it a differential point in the diagnosis between disseminated sclerosis and disseminated myelitis.

Charcot further noted alterations in the blood-vessels within the areas. In the peripheral zone even the finest capillaries were prominent, and in the central zone the walls of the vessels were very thickened, and contained numerous nuclei. Fatty granulations were also found in recent areas, not only in the meshes of the reticulum, but also in the walls of the blood-vessel, especially in the transition and peripheral zones. These granulations were thought to be due to the disintegration of the myelin sheath. A peculiar alteration in the nerve cells was described, which was designated "yellow degeneration"; this was a form of atrophy of the cell, with a disappearance of the cell-processes.

Charcot related the peculiar intention tremor, so characteristic of disseminated sclerosis, to the absence of the myelin sheath from the long-persisting axis cylinders. The transmission of voluntary impulses would thus still proceed by means of the

denuded axis cylinders, but it would be carried on irregularly in a broken or jerky manner, and would thus produce the oscillations which disturb the due execution of voluntary movements. It was thought possible also that the naked axis cylinders might again clothe themselves with myelin, and thus effect a *restitutio ad integrum.*

In reading Charcot's lectures, one is struck by the accuracy of the observations, made with so limited a histological technique, and one must admit that, in spite of recent specific staining methods, little has been added to the classical histological picture of Charcot.

B. *Primary Change in the Parenchyma.*

All the writers in this group regard the change in the myelin sheath of the nerve fibre as the primary one: they contend that an infective or toxic "noxa" may act directly and primarily upon the nerve fibre before there is any trace of glia proliferation, and without a primary vessel disease.

Redlich (1896) considers that the first impulse to the disease may be given, *e.g.*, by infective diseases, in such a way that there is brought about an acute degenerative decay of the myelin sheath of the nerve fibre, analogous to that produced by experimental infection of micro-organisms or their toxins. He thinks that the acute degeneration of the myelin sheath finds an analogy in peri-axial neuritis, which likewise is found in toxic diseases. Redlich suggests that a further advance of the disease may be caused by the original agent having caused, in addition to the evident areas, an alteration in the nutrition of other portions of the central nervous system, and later, through excess of function or strain, these parts may perish.

The vessel changes are looked upon as accessory phenomena, for the great irregularity in the distribution and form of the areas in the cord seemed to argue against the dependence of the foci on the vessels. The interstitial changes in the glia are regarded as dependent upon the parenchymatous degeneration, though it is admitted that the absence of definitely proved areas in the peripheral nerves argues for the presence of glia as essential to the process.

Redlich thinks that all the actual histological changes found in disseminated sclerosis may be found in other conditions, but

their actual grouping is characteristic of disseminated sclerosis. He distinguishes three types of areas:—

(*a*) Very dense patches which consist of very fine parallel fibrils with glia cells and nuclei. The processes of the cells are often very distinct, and give to the cell the appearance of beautiful spider cells; the cross-section of the fibrils gives the impression of granules. Within these areas few myelin sheaths are left, and the axis cylinders persist, but are swollen or atrophied. The transition to normal tissue is a gradual one.

(*b*) A large-meshed tissue with thickened glia trabeculæ but no definite area. In this tissue the vessels are more or less changed, the walls frequently hyaline, and the peri-vascular glia increased.

(*c*) A wide-meshed network with glia trabeculæ only slightly thickened. The nodal points of this meshwork are occupied by glia cells with their processes; the meshes are empty because the nerve fibres have completely perished, and the tissue has an areolar appearance. In the neighbourhood of these areas are found nerve fibres, both myelin sheaths and axis cylinders, undergoing acute degeneration. Such areas are often accompanied by secondary degeneration, and Redlich thinks that there is no connection between these and those of the first kind.

In the grey matter are found areas of the first and second types, in which the ganglion cells remain for a long time exempt.

Huber (1895) also accepts the view of a primary parenchymatous change, *i.e.*, "a simple degenerative decay, not an actual inflammatory decay."

C. *Primary Blood-Vessel Alterations.*

This view, stated in simple terms, is that the chief and essential rôle in the process is ascribed to the changes in the blood-vessels: these give rise to an altered nutrition of the surrounding tissue, leading to degeneration of nerve fibres or to an extension of the inflammatory process to the peri-vascular tissue, with subsequent or simultaneous glia proliferation.

Rindfleisch (1863) was the first to note the significance of blood-vessel changes in the areas of "grey degeneration," and the intimate relation of these areas to the blood-vessels. It was thought that a chronic irritative condition of the vessel wall

introduced the process: that the consequent altered nutrition of the tissue led to changes in the nerve fibres, and, through the extension of the formative irritation, the surrounding glia was involved in a radiating direction. Rindfleisch found the walls of the small arteries and all their delicate ramifications enormously thickened and infiltrated with cells, even in the earliest stages of the process: the walls of the capillaries and veins were also surrounded by numerous nuclei.

Rindfleisch looked upon the glia as a fused protoplasmic mass with inserted nuclei. He thought that in "grey degeneration" there set in a re-division of the protoplasm around the nuclei, while the periphery of the cell elements, which thus arose, formed into fine fibres. The final result was a feltwork of fine fibres, which is saturated, like a sponge, with a mucoid fluid containing only a few nuclei. He also gave the first accurate description of the large multi-nucleated, ramified glia cells found in the early areas—the so-called spider cells, or monster glia cells, or Deiter cells, or Rindfleisch cells.

Rindfleisch gave no suggestion as to the nature of the final cause of the postulated alteration of the vessels, nor of the cause of its special distribution. The sequence of the process was as follows:—(1) The change in the vessels; (2) atrophy of the nerve elements from malnutrition; (3) metamorphosis of the connective tissue (glia).

Ribbert (1882) related the areas in disseminated sclerosis to a primary disseminated thrombosis. He described in all the patches a congested vessel, and in several the vessel was so cut that it ran through the whole extent of the area. In two small patches cut in serial sections there were found in the lumen of the vessel white blood-cells, partly adherent to the vessel walls and partly filling the vessel as emboli. Ribbert looked upon these as multiple thrombi, and thought that they played an important rôle in the causation of the process, for in such thrombosed areas arose the commencing emigration of leucocytes. He thought that the characteristic form of the areas might well be accounted for by multiple emboli, and he also related to the blood-vessels the fact that the cerebral areas so frequently reached up to the cortex, but did not involve it—explaining this circumstance by the few anastomoses between the vessels of the white and grey matter.

Ribbert thought that the exciting cause of the inflammation

circulates in the blood, and that owing to its presence a clot formed at some part of a small blood-vessel. At this point an irritation of the vessel wall is set up with a peri-vascular inflammation; this inflammation extends around the blood-vessel and invades the surrounding tissues, causing degeneration of the nerve fibres and an active proliferation of the glia. The glia nuclei proliferate and form large cells with an abundant protoplasm from which radiates the fibre-work of the glia. The fat granules, arising from the degeneration of the myelin sheath, are taken up by the emigrated white blood-cells, and are carried to the lymph sheaths of the blood-vessels. The proliferated glia, after the removal of the fat, forms numerous fibrils, and thus arises a dense grey sclerotic area in which the protoplasm even of the large nucleated cells disappears.

French writers support chiefly the vascular origin of disseminated sclerosis. Amongst these may be mentioned the names of Déjerine and Pierre Marie.

Déjerine (1824) maintained that the configuration and dissemination of the areas could be explained only by relating them to changes in the blood-vessels. He found the blood-vessels altered, with a peri-arteritis and their calibre diminished, and that a vessel, thus changed, was the central point of each plaque. Déjerne thought that the causal factor, a microbe or a humoral agent of undetermined nature, circulated in the blood-vessels, modifying in some way their nutrition, and that this was the primary change. The effect on the surrounding tissue is seen first in the glia, which by its proliferation caused an "excentric compression of nerve tubes," leading to their disappearance.

Pierre Marie (1884-1895) has emphasised the special relation of disseminated sclerosis to infectious diseases, especially enteric fever, pneumonia, scarlet fever, and measles, and, of lesser importance, diphtheria, whooping-cough, erysipelas, dysentery, and even cholera. Marie thinks that disseminated sclerosis is due, not to the different micro-organisms which produce these diseases, but to a combined infection occurring during their course. He suggests that the lesions in the brain and spinal cord are probably due to an ordinary pathogenic microbe, whose special action is due to its special localisation. The etiological influence of the infectious diseases is such that there may result changes of the vessels, and the sclerotic areas are therefore due to the localisation

of infectious vessel disease in the central nervous system. Most French writers, among whom Phillippe and Jones may specially be mentioned, have accepted this conception of Marie's, which, as can be seen, is a deduction from Ribbert's.

Regarding the histological characters of the areas, Marie laid special stress on the alterations in the blood-vessels and the persistence of the axis cylinders. The external coat of the vessel is specially affected, and on this account the lumen appears open and dilated in areas where the sclerosis is pronounced. The perivascular sheaths are full of granular bodies. From the persistence of the axis cylinders the following deductions are drawn:—(1) The absence of secondary degeneration in the path of the nerve fibres; (2) the remission, improvement, and even cure which may occur, since the part of the nerve absolutely necessary for the transmission of the nervous current is retained; (3) it throws light upon the pathology of tremor.

Marie regards disseminated sclerosis as an interstitial process which has its origin in the blood-vessels. Possibly the infectious agent itself, rather than the materials which it secretes, brings this about, considering the dissemination of the lesions and their essentially embolic character. The presence of fat granular cells at the periphery of the islets points to the continued activity of the morbid process, since the products of the degeneration of the nerve fibres are not yet fully absorbed and are still being produced.

Marie also points out that there are two forms of sclerosis: the one, in which the foci have a clear-cut appearance and in which numerous axis cylinders are found within the glia sclerosis; and a second, with diffuse foci having very irregular and deeply indented borders, and in which axis cylinders as well as myelin sheaths have often perished. He thinks that these two forms are distinct and are due to different causes, though both are probably a sequelæ of infectious disease. The latter is referred to under the name of "diffuse multilocular sclerosis," and the classical symptoms of disseminated sclerosis are frequently absent, especially the intention tremor, disorders of speech, and the eye symptoms. Paralysis is more often present, and its course is often rapidly fatal.

Williamson (1894-1908). A brief description of the pathological anatomy of disseminated sclerosis, as outlined by Williamson, has already been given. It remains to be added here that this

author strongly supports the view of an alteration of the blood-vessels caused by a primary altered blood condition. The irregular distribution of the sclerotic patches, without any relation to nerve tracts or nerve fibres, seems to him suggestive of a primary change either in the blood or the blood-vessels or lymphatics. The frequent presence of marked vascular changes, *e.g.*, the infiltration of the peri-vascular sheaths with round cells in the early areas, and the sclerotic or hyaline thickening of the vessel walls in older areas; the presence of a vessel with altered walls in the centre of an area; and occasionally the extension of an area of sclerosis corresponding to the area of distribution of a blood-vessel, all point to the primary dependence on the blood-vessels. Williamson records a case where one of the areas corresponded roughly with the distribution of the anterior median artery of the spinal cord at one region, and the vessels in the anterior median fissure were dilated and surrounded by round cells and nuclei before they entered the substance of the cord. A thrombus was also present in the anterior median vein just at the commencement of the anterior median fissure, and several small thrombosed veins were found in the pia mater on the surface of the cord.

The pathological changes in disseminated sclerosis are thought to be very suggestive of the presence of some irritating substance in the blood, which stimulates the endothelium of the walls of blood-vessels and of the walls of the peri-vascular lymphatics, and which causes an extravasation of toxic lymph into the surrounding nerve tissue, with consequent degeneration of the myelin sheath of the nerve fibre. The presence of recent patches alongside old patches shows that the morbid agent persists in the organism, and is able to cause the development of new patches of the disease long after the onset of the affection.

Goldscheider (1896). The views of this writer are very similar to those of Williamson. He believes that the walls of the blood-vessels play an important rôle in the process, and that substances giving rise to cell-proliferation affect the walls of the blood-vessels by filtration and diffusion from the blood. The peri-vascular inflammation leads first to a solution of the surrounding myelin, and this leads to a reactive interstitial inflammation. Goldscheider thinks that disseminated sclerosis is a disseminated myelitis running in acute and subacute stages.

D. *Disturbances in the Lymph Circulation.*

Changes in the lymphatics of the central nervous system have recently received considerable attention. In disseminating sclerosis the lymphatic spaces of the adventitia of the blood-vessels are frequently distended and filled either with fluid or with cells, or they are more or less obliterated by dense fibrous tissue. Borst was the first to bring these changes, which are dependent on a primary disease of the blood-vessels, into causal relationship to the areas of sclerosis. The disturbed lymph circulation expresses itself in characteristic serous infiltration, and the obstruction to the return of the lymph causes a lymph stasis in the area, which leads both to a myelin sheath degeneration and a forcing apart of the meshes of the glia, on the basis of a hyperlymphosis.

Borst (1897-1904) made a very careful histological investigation in five cases of disseminated sclerosis. He has also written a review of the whole subject (1904), a review to which I have already expressed my frequent indebtedness. On the grounds of his own investigations Borst thinks that the indications of lymph congestion and lymph stasis were sufficiently significant to account for the origin and for the dissemination of the areas. The areas were very sharply defined macroscopically, and within each a blood-vessel, cut longitudinally or transversely, could be traced, surrounded by a delicate peri-vascular space. Microscopically the pia of both brain and spinal cord was thickened, and all the vessels, especially the arteries, were also thickened: the vessels within the areas were hyaline and often obliterated, especially the paracentral vessels. Outside the areas the blood-vessels were also thickened and their lumen narrowed. In several cases the thickened vessel was the apex of an oval area. There was frequent marked glia proliferation around the central canal. Borst specially emphasises the presence of cystic spaces, often even macroscopically evident, around the obliterated vessels: these spaces were lined by cubical epithelium, probably arising from the glia, in virtue of its origin from the ependymal epithelium. These cystic spaces were regarded as having undoubtedly arisen in relation to the obliterated vessels, and, apparently, first as delicate peri-vascular spaces: they were, therefore, an expression of the obvious congestion of the lymph circulation.

As a further expression of this congestion there were found

disseminated areas, usually round or oval and distinctly circumscribed, within which there was a rarefaction of the myelin constituents of the nerve fibres, while the axis cylinders remain naked. The glia in these areas is very delicate, and the glia cells are transformed into large protoplasm-rich forms. Such areas are described as "Lichtungsbezirke," are ascribed to a hyperlymphosis of the tissue, and are looked upon as a fore-stage of the sclerosed areas. When the increased pressure of the lymph is removed, the glia undergoes proliferation and invests the persisting axis cylinders with a more or less dense fibre feltwork. The proliferation of the glia need not always be solely a substitutive process which arises in consequence of the degeneration of the myelin: the existing hyperlymphosis may act as a stimulus to the glia, causing an inflammatory glia proliferation.

What the final cause is which acts on the membranes and the vessel walls, Borst concludes must be mere conjecture. The virus, in acute infections, courses in the first place in the blood, and from it passes through the walls of the vessel, causing an arteritis and a peri-arteritis in more or less intense degree. According to the degree of the lesion produced in the vessel we get abnormal permeability, diminished resistance to the oscillations of blood-pressure, and paralytic dilatation. Later, owing to a longer-acting irritant, the vessel changes assume a more or less productive character and express themselves chiefly in thickenings of the vessel wall and narrowing of the lumen. Through these processes in the vessel walls occur circulatory and nutritive disturbances. Borst's view is, therefore, an extension of Rindfleisch's view; he ascribes to the influence of the disturbed lymph-circulation the origin and extension of the process, but the changes in the vessel walls give occasion to the existence of the lymph-congestion.

Arndt (1875) had, previous to Borst, laid emphasis on the influence of lymph-congestion in the production of areas of "grey degeneration." Arndt looked upon the glia cells and their processes as lymph bodies and canals, *i.e.*, as the roots of the lymph vessels: he believed that in lymph-congestion these lymph-carrying elements swell and finally burst, setting free the lymph in the surrounding tissue. The nerve fibres then degenerate in consequence of the pressure of this congested lymph. Though Arndt's views on the glia texture of the central nervous system have been given up, his view of the influence of the disturbed

lymph-circulation on the structural elements of the central nervous system, and especially in relation to "grey degeneration," is very important.

Schmaus (1901-1905) has also ascribed a considerable significance to the presence of lymph-congestion and œdema in a large number of general diseases, *e.g.*, pernicious anæmia and chronic nephritis. The œdema leads to a dilatation of the meshes formed by the glia, to a swelling of the whole glia tissue, which may advance to such an extent that the fibrils blend to a homogeneous glassy or slightly granular mass, and to the presence of a homogeneous or granular substance in the lymph sheaths of the vessels. The myelin sheaths swell and become varicose, and the axis cylinders are swollen and twisted, on longitudinal section. That these signs are not pre-agonal or agonal is proved by the frequent presence of fat granular cells in the lymph sheaths of the vessels. In such diseases one is inclined to trace the origin of the œdema to toxic substances which circulate in the blood and cause an injury of the vessel wall, which thus becomes permeable to the serous fluid and allows of an increased transudation of (toxic) lymph.

In disseminated sclerosis Schmaus thinks that the dilatation of the peri-vascular lymph spaces can be explained only by the assumption of a congestion in the lymph stream, which, therefore, distends them. The changes in the blood-vessels, especially the frequently observed adhesions of their lymph sheaths, and the frequent adhesion and thickening of the meninges, lead to this obstruction to the lymph stream. The acute infection which precedes the disease (disseminated sclerosis) gives rise to these chronic inflammatory and proliferative processes in the vessel walls; these, on the one hand, lead to weakening of the vessel wall and dilatation of its lumen, and on the other hand to condensation and adhesion of its lymph sheaths. Thus is brought about an obstruction to the lymph flowing away, and, in dependence on this lymph stasis, a swelling and degeneration of the nerve fibres in the "Lichtungsbezirke." When the glia in such areas undergoes a compensatory growth, we get the formation of a sclerosed area. Thus a hyperlymphosis may be regarded as the "Grundlage" of the disease, and this may explain the various types of areas found in disseminated sclerosis. Schmaus thus supports Borst's view of a hyperlymphosis, but attributes to it far

less significance than Borst, for he thinks that the constancy of blood-vessel and meningeal changes is by no means proved.

(2) Process underlying Multiple Sclerosis founded upon a Disturbance of Development.

A. *Deficient "Anlage" of the Nerve Elements, with Hypoplasia or "Agenesie" of the Myelin Sheath.*

Schiff and other writers have thought it possible to trace disseminated sclerosis to partial or total absence of the myelin sheath formation. We know that the appearance of the myelin represents a definite stage in the development of the nerve fibre. This myelination sets in at different periods in different tracts, and even in different fibre areas of related tracts. The naked axis cylinders might, therefore, be looked upon as incompletely developed nerve fibres. Friedreich's ataxia has been traced to such a deficient development, and Schiff sees in the fact that in Friedreich's ataxia the glia development approximates in intensity to that found in disseminated sclerosis a possible analogy. He thinks that disseminated sclerosis may be due to a deficient or arrested development of the myelin sheath in the affected areas. Kahler and Pick have ascribed system diseases to such an arrest of development. Schmaus thinks this view worthy of consideration; but Borst, while acknowledging that certain parts remain at an early stage of development, thinks that such an explanation is possible only for system diseases, and that it is improbable that multiple scattered arrests of development can occur. Most writers have agreed with this attitude, and supporters of the developmental nature of the process relate it rather to disseminated defects in the glia framework of the central nervous system.

B. *Multiple Defects in the Glia Framework of the Central Nervous System.*

Strümpell (1896) was one of the earliest advocates of this view. He speaks of a "multiple gliosis," and draws comparisons with multiple fibromata, lipomata, neuromata, &c. He looks upon the etiological factors of an exogenous nature only as

exciting causes, and he thinks it very unlikely that we should find a primary affection of the smallest vessels in the central nervous system, and not in the other organs of the body. Strümpell further recognises it to be necessary, in other cord affections, *e.g.*, hydromyelia and syringomyelia, in which we have marked glia proliferation, to have recourse to congenital anomalies of development. In disseminated sclerosis he thinks that the proliferation of the glia gives the impression of a primary process, and that it cannot be traced to a previous degeneration of the nerve elements.

Schmaus holds that both the view of a congenital hypoplasia or agenesia of the myelin sheath, and that of the possibility of inserted islets of glia with a special capacity for proliferation, are worthy of consideration, at least so long as no other proof is brought forward. He thinks that the most important objection to the developmental theory is that from this kind of pathogenesis numerous forms of disseminated sclerosis must be excluded. He therefore distinguishes between primary disseminated sclerosis, due to developmental defect in some form, and secondary disseminated sclerosis, the consequence of an acute disseminated myelitis. This secondary form of disseminated sclerosis is only one of a group of allied diseases, which includes advanced vessel disease and disseminated syphilitic disease of the vessels, and all of which may lead to the formation of scattered sclerotic areas in the central nervous system. Schmaus further thinks that diffuse forms of disseminated sclerosis, or "diffuse multilocular sclerosis," in which the areas have not the defined outline nor the characteristic preservation of the axis cylinders, found in true disseminated sclerosis, must be regarded as "chronic myelitis."

Ziegler, in the last edition of his text-book, also differentiated primary and secondary disseminated sclerosis. Primary disseminated sclerosis may be due to the incomplete development of the myelin at certain parts, or to glia abnormality in the sense of an abnormal quantitative distribution of the glia, or deficient idioplastic differentiation of the glia. The areas typical of primary disseminated sclerosis contain dense sclerotic tissue, with persisting axis cylinders in the narrow meshes. Secondary disseminated sclerosis is thought to be due to multiple ischæmic areas, with secondary proliferation of the glia. The areas typical

of this form are areolar, and contain few axis cylinders in the widened meshes.

Balint (1900), Bartels (1903), Probst (1898), Hoffmann (1902), and others likewise speak of an abnormal or inherent disposition of the glia, an early "invalidity" of the central nervous system, or an abnormal congenital "Veranlagung" of the glia.

Müller (1904), in an important monograph, "Die multiple Sklerose des Gehirns und Rückenmarks," has made a careful survey of the whole subject of disseminated sclerosis, especially in relation to its clinical course, differential diagnosis, and pathogenesis. He strongly supports Strümpell's view of the developmental nature of the disease, and emphasises the distinction between primary and secondary disseminated sclerosis. The views set forth in this monograph are more fully examined in a later section. In a later paper (1906) Müller urges the early diagnostic importance of the ocular disturbances: affection of the optic disc, especially in relation to the acuteness of vision and the field of vision, nystagmus, and paralysis of the ocular muscles. He looks upon these as more valuable signs than the so-called classical symptoms of the disease. The *formes frustes* are regarded as presenting a typical syndrome which permits of their ready recognition. In a further paper (1910) he relates the disturbances of sensibility, which are almost always present, at least to a slight degree, to affections of the cranial and spinal nerve roots in the glia-containing parts of their course.

(3) More Recent Researches, 1903-1913.

Bielschowsky (1903) has investigated five cases of disseminated sclerosis by means of a silver-impregnation method for axis cylinders. He found in sclerotic areas axis cylinders preserved in such large numbers that the areas could scarcely be distinguished, in consequence of the numbers of axis cylinders running in normal order and with normal calibre. The presence of thickened vessels in the sclerotic areas alone served to indicate the patch. In other areas the axis cylinders were sinuous and swollen, or split up into a bundle of parallel-arranged fibrils, or, again, broken up into a series of pearl-like swellings. Bielschowsky discusses the question of the axis cylinders present being regenerated or persistent axons, and comes to the conclusion that

they must be chiefly persistent. He bases his view chiefly on the facts that the topographical arrangement of the fibres is maintained, and that in longitudinal section myelin fibres could be traced directly into the sclerotic tissue, there to lose their myelin sheath and again to become connected with myelinated fibres at the limit of the area. Bielschowsky states that there was a far-reaching correlation between the clinical histories and the impregnation pictures, and claims that, by his method, the relationship between symptoms and anatomical findings is made more evident than by any other method. He thinks that the finest axis cylinders disappear first, the coarser ones being preserved longer, but admits that the coarser axis cylinders may be swollen fine ones. The possibility of a slight regeneration of nerve fibres is admitted, fork-like divisions being probably regeneration appearances, and brush-like splitting up probably degeneration signs.

Bielschowsky regards the nature of the process as essentially an inflammatory one, attacking both the parenchymatous and interstitial tissues, but affecting the nerve fibre more uniformly than the glia. He looks upon the vessel changes as secondary to the resorptive processes, and thinks that the circulating "noxa" passes through the vessel wall, leaving it intact.

Bartels (1904) has examined four cases of disseminated sclerosis, and supports Bielschowsky's view of the persistence of the axis cylinders in opposition to Strähuber's view of the regeneration. By means of Kaplan's, Strähuber's, and Bielschowsky's staining methods, he has demonstrated the direct transition of the fibres within and without the foci. He considers that the fibres stained with aniline blue are those in which the myelo-axostroma (axo-chromatenin) survives the destruction of the myelin sheath.

Strähuber (1903) thinks that the disposition to disseminated sclerosis might be occasioned by inborn defects, as well as by minimal tissue injuries that have arisen in the place of earlier injuries or local anæmias. Such parts are "loci minoris resistentiæ" for bacteria or toxins reaching them from the blood. On the other hand, bacteria or toxins in the blood, in consequence, for example, of infectious diseases, find favourable conditions for development in such parts with local tissue degenerations. These may be the result of capillary bleedings arising from concussion

and other causes, or local anæmias arising from chill or nervous action (fear), &c. Strähuber regards the process, on the whole, as an inflammatory one, affecting both the nerve fibre and the glia tissue simultaneously.

Strähuber has found sclerotic areas in peripheral nerves, and looks upon these as an expression of the same process. Borst, however, thinks that the investigations were not sufficiently exhaustive, and certainly insufficient to prove Strähuber's contention that a primary proliferation of the glia is not the essential factor in disseminated sclerosis. Müller interprets such areas in the peripheral nerves only in the sense of Gombault's peri-axial neuritis, and thinks that the cases in which they occurred were cases of true acute disseminated myelitis.

By means of a new staining method for axis cylinders, Strähuber concluded that a regeneration of nerve fibres must take place in the areas of sclerosis. He bases his arguments upon the finding of very fine nerve fibres with very small medullated sheaths, and also on the presence of fine naked axis cylinders. These fine nerve fibres, he thinks, are too numerous to be persisting fine axis cylinders, and cannot be compressed nerve fibres, nor terminal stages of a previous swelling, nor primary atrophied nerve fibres.

Shoyer (1903) notes that a limited number of the patches in the cord in disseminated sclerosis assume certain primary forms, and that the remaining patches can be shown to be due to the coalescence of these primary forms. The primary forms, of which he distinguishes five, are related to the following structural features of the cord:—(1) The posterior fissure; (2) the anterior fissure; (3) the central canal; (4) the points of entry or exit of nerve roots; (5) a point in each lateral margin of the cord. Shoyer thinks that the shapes of the patches suggest that the changes which form them start in these points to which they are thus related. The oval shape of the first form, the wedge shape of the second and fourth, the circular shape of the third and fifth, all suggest that the active agent enters along the fissures, along the nerve roots, or from the central canal. The distribution of the lesions can, therefore, be explained by the assumption that they are caused by a poisonous agent conveyed by the cerebro-spinal fluid, which finds entry along these roots.

Tredgold (1904) has given an account of the microscopical

examination of three cases of disseminated sclerosis, each of which was typical of a distinct clinical variety. These were, respectively, the spastic paraplegic, the transverse myelitic, and the cerebellar types. He notes that even in the absence of such symptoms as tremor and nystagmus, a careful examination will often reveal some peculiarity in the grouping of motor, sensory, or reflex signs which could only be brought about by disseminated sclerosis. The chief symptoms may, therefore, simulate other diseases, but there are present other signs, not characteristic of such diseases, which could be produced only by disseminated lesions. In each case sclerotic islets were found in both brain and spinal cord, and in each the peri-ventricular and peri-aqueductal localisation was marked.

The microscopic examination, which was very thorough revealed areas of three types—hard, soft, and intermediate: frequently one area showed all three stages. The hard islets, most numerous in the cord, consisted of dense neuroglia fibrils with few glia cells and only an occasional axis cylinder: typical areas of softening were confined to the brain, and consisted of a loose reticulum, containing a semi-fluid material, but no proliferated neuroglia, nor products of degeneration; the intermediate islets contained nerve fibres in all stages of degeneration and the products of degeneration, but no proliferated neuroglia fibrils. Tredgold thinks that the essential process is one of myelin degeneration independent of vascular disease, and that the initial changes are strongly suggestive of the presence of a circulating toxin.

Bramwell (1904) has studied disseminated sclerosis with special reference to the frequency and etiology and prognosis of the disease, and has discussed its pathology. The author inclines to the view that the disease is due to some developmental or congenital defect of the neuroglial or nervous tissue (perhaps similar to or analogous to the gliomatosis in cases of syringomyelia), which renders it more liable to be affected by irritation than the glial or nervous tissue of the normal individual. He thinks that the diversity of conditions which were thought to be the cause in individual cases makes it difficult to suppose that the alleged cause was in reality the starting-point or sole cause. With regard to the nature of the hypothetical toxin carried to, and distributed through, the nervous tissues by the blood-vessels,

he writes: "The recurrence from time to time of the symptoms after periods of improvement and remission is very suggestive of repeated intoxications. If disseminated sclerosis is due to a toxin, the toxin, whatever it is, is probably produced within the body. It seems much more difficult to suppose that fresh doses of the toxins are introduced again and again into the body from without during a long period of years." Bramwell's views as to the nature of this toxin are referred to later.

Dinkler (1904) gives a description of the clinical and microscopical appearances in a case of disseminated sclerosis in which there had been spastic paraplegia of a slightly progressive character for eighteen years, but with no nystagmus, intention tremor, scanning speech, nor sensory disturbances.

The distribution of the patches was peculiar in that the majority lay in the brain cortex. The myelin sheaths in these areas had undergone fatty degeneration, and the axis cylinders showed a distinct participation in the diseased process. Changes in the ganglion cells of the cortex accompanied the changes in the nerve fibres, not only in the actual areas, but in the adjoining tissue. Nests of small cells, probably glious in origin, surrounded each ganglion cell, causing deformity and atrophy: their injurious action on the ganglion cell is compared by the author to that of osteoblasts. The blood-vessels of the cortex and of the membranes, and the membranes themselves, were normal.

A further peculiarity was the presence of numerous tumour-like swellings on the anterior and posterior roots close to the cord. Microscopically these showed degeneration of the myelin sheath, marked proliferation of the Schwann nuclei, and persistence of the axis cylinders. Later, the axis cylinder disappeared and the central part of the nucleated hyperplastic zone became hyalin and structureless. The spinal ganglia and peripheral nerves were not preserved.

In correlating the clinical and anatomical appearances two points of importance stand out: (1) the considerable diffusion of the ganglion cell changes in the cortex and the apparently normal intellectual and physical functions; (2) the appearance of posterior root changes without any sensory disturbances.

Spiller and Camp (1904) give an account of two cases, one of which was of the type of a multiple myelitis. They regard it as exceedingly difficult to determine the relation of disseminated

sclerosis to multiple myelitis. In the latter disease the areas of sclerosis are much less sharply defined, and in some cases the peri-vascular cellular infiltration is marked without any close relation to sclerotic areas. The authors emphasise the frequent implication of the visual tracts in disseminated sclerosis, the most frequent seat being the optic chiasma. The disturbance of vision may be slight compared with the anatomical alterations. Ophthalmoscopic examination is of great importance, in every case presenting symptoms that can be attributed to disseminated sclerosis, and pallor or even atrophy of the discs may exist even when the vision is not complained of.

Dercum and Gordon (1905) describe the anatomical findings in a case of disseminated sclerosis, and briefly discuss its pathogenesis. They think it is unlikely that the relation of the blood-vessel changes to the sclerosed areas is that of cause and effect. They conclude that the origin of the process may be in the glia, but that at present it is impossible to go further than to infer that neither nerve cells, nor axis cylinders, nor blood-vessels are primarily involved.

Ceni and Besta (1905), in the course of a series of experimental researches upon the pathogenicity of aspergillus spores, observed a dog which presented symptoms closely resembling disseminated sclerosis. Ceni's previous researches had led him to the conclusion that aspergillus infection is the essential cause of the pellagra, and that this condition is dependent upon the presence of the parasite in the spore form, in which it elaborates very virulent toxins. Animals inoculated intraperitoneally, frequently developed spastic paraplegia with tremors, and the spinal cords of such animals showed primary degeneration of the crossed pyramidal tracts and posterior columns. In this dog the spastic paraplegia and tremors disappeared at the end of the second month, and the animal showed symptoms characteristic of both locomotor ataxia and disseminated sclerosis. The animal was killed three months after infection with the aspergillus fumigatus, and, at the autopsy, the spinal cord, especially in the cervical region, presented very numerous softened and gelatinous foci. These foci presented many of the characteristics of areas of "sclérose en plaques": the myelin sheaths had disappeared; the axis cylinders were persistent, though swollen; the neuroglia was somewhat hyperplastic; there were numerous fat granule cells in the vessel sheaths, and the

vessel walls were infiltrated with numerous small round cells. The vessel alterations were present also in the surrounding normal tissue, and there was a complete absence of secondary degeneration.

The authors regard these areas as intermediate in position between disseminated myelitis and disseminated sclerosis, and also regard them as a proof of the vascular origin of the sclerotic process. They emphasise the fact that in those cases in which aspergillus infection produced a primary system degeneration, there was no trace of any vascular lesion, a circumstance which proves that alterations of myelin are unable of themselves to produce lesions of an inflammatory character.

Catola (1905) gives an account of a case in which trembling of the lower limbs developed a few days after the onset of an attack of cholera. Later, the classical symptoms of disseminated sclerosis appeared, and the gait was ataxic-cerebellar and spastic. Histologically there were marked sclerotic areas at various levels in the cord: in the lumbar cord the sclerosis was limited to the pyramidal tracts. In the cerebellum the nucleus dentatus was affected on both sides, but its cells were preserved. One superior cerebellar peduncle was atrophied in its middle portion, but the middle and inferior peduncles stained normally. The vessels both of brain and cord and membranes were thickened and homogeneous both in the sclerotic areas and in the rest of the tissue. The author thinks that the cholera was an etiological factor, and that the process was probably of vascular origin. He also notes that although the areas had such an anatomical restriction, the classical symptoms of disseminated sclerosis was nevertheless present. Of special interest is the pronounced sclerosis of the dentate nuclei, in view of the cerebellar ataxia.

Taylor (1906) states, in evidence of the extraordinary interest which is being taken in disseminated sclerosis, that he has been able to discover eighty papers dealing with this disease in the literature of 1904 and 1905. He has personally examined several hundred specimens from eight cases. He was unable to find any trace of an inflammatory reaction in the areas of sclerosis. The blood-vessels in the various lesions showed no relation to the degenerated areas, nor did the blood-vessel walls show any alteration in the sclerotic areas as contrasted with normal areas. The symmetry, such as it was, appeared to the author to be entirely fortuitous, and both grey and white matter are involved. The

peripheral nerves showed no degeneration, but numerous discrete patches were found in one dorsal nerve root with typical myelin degeneration and no other apparent change. "The conviction is strong that the lesions are localised sclerotic areas, characterised by the usual disintegration of myelin without either primary or compensatory neuroglial overgrowth."

Taylor notes that various types of lesion may co-exist in the same case: sharply defined clean-cut areas in contrast to a more diffuse type, in which the area shades off into the normal. He follows Williamson's explanation of the sharp delimitation of the process in certain areas, by suggesting the presence of a toxic agent, of unknown character, but with a special affinity for myelin, which spreads from a central focus until it exhausts itself. This causal agent reaches the tissue in all probability by the blood or lymph channel, but its manifestation may occur without evidence of local inflammation.

Marburg (1906), in an important monograph, "Die sogenannte akute Multiple Sclerosis," gives a report of three cases, and a review of others recorded in literature of disseminated organic disease of the nervous system which, from their resemblance to disseminated sclerosis, both clinically and pathologically, have been described as acute or subacute multiple sclerosis. The disease occurs usually between the ages of twenty and thirty. The symptoms indicate that there are multiple lesions in the brain and spinal cord; the onset is gradual; there is no fever; and though the affection is progressive, there is a tendency to remission and fluctuation in the symptoms. In the majority of the cases recorded, death occurred within three months, in some cases earlier, in some later.

The author considers that this so-called acute multiple sclerosis is a form of true multiple sclerosis which is characterised by a more rapid course of the disease. The symptoms indicate that it is a form of multiple sclerosis, especially the mode of onset, the advance of the disease in stages, the remissions and intermissions, and the indications of multiple lesions.

The pathological changes are characterised by degeneration of the medullated sheath of the nerve fibres, while the axis cylinder is relatively intact. At the same time, or soon afterwards, there is proliferation of the neuroglia cells, and of cells in the walls of the blood-vessels. The process is analogous to peri-axial neuritis.

The pathological changes are inflammatory, and belong to the group of degenerative inflammatory changes. The nature of the degeneration of the medullated sheath of the nerve fibres indicates that it is due to a "lecitholysis," such as can be produced experimentally by "ferment" action. The pathological changes may, therefore, be regarded as the result of a toxin, and their final stage is the complete replacement of the degenerated nervous tissues by a finely fibrillated neuroglia tissue, which contains only a few nuclei.

The affection is regarded by Marburg as a form of degenerative myelitis, and he suggests for it the name of "encephalo-myelitis periaxialis scleroticans."

Wegelin (1906) records a case which shows the great difficulty of drawing the distinction, emphasised by Müller, between the acute cases, following disseminated encephalo-myelitis, and the true "sclérose en plaques." The disease in this patient ran a very rapid course, and at the autopsy typical areas of sclerosis were found disseminated through the brain and spinal cord, and in the upper three dorsal segments there was a total transverse sclerosis. The vessels in most of the areas showed few changes, thus differing from the usual findings in cases of acute multiple sclerosis, and the extension of the areas in no way corresponded to the vessel-distribution. Ganglion cells and axis cylinders in the areas were not essentially changed; there was intense glia proliferation, and an absence of any considerable secondary degeneration.

In the clinical history there was nothing to indicate infectious disease, and during the course of the illness there was no rise of temperature till the onset of the broncho-pneumonia from which the patient died. The author claims that this case could not be regarded as a myelitis, and looks upon it as proving the existence of true acute disseminated sclerosis. He considers that Müller's grouping of all such cases as "secondary disseminated sclerosis" is arbitrary, as no distinction can be drawn between the acute and chronic cases.

Stadelmann and Lewandowsky (1907) also describe a case, whose acute course (eight weeks) justifies the assumption of an acute multiple sclerosis or acute disseminated myelitis. Areas of sclerosis, composed almost entirely of neuroglial tissue, were found very widely distributed through brain and spinal cord. In

the areas there was a distinct vessel proliferation with increase of adventitial cell elements, but no sign of small-celled infiltration. The writers look upon their case as one of acute multiple sclerosis, "in virtue of the absence of any marked signs of actual inflammation."

Schob (1907), in a careful histological analysis of the sclerotic areas in a typical case of disseminated sclerosis, lays special emphasis on the pathological changes found in the nerve roots. From these changes he claims that the process in the peripheral nervous system is analogous to that in the central nervous system —in both a myelin sheath degeneration, relative integrity of the true nervous elements, proliferation of the supporting tissue, and the essentially localised extension of the affected tissue. He states that the case belongs to the rare observations where "with certainty," in addition to areas in the central nervous system, circumscribed and analogous areas are found in the non-glial containing tissue, and relates it to a combination of a neurofibromatosis in the nerves, and a gliomatosis in the central nervous system. The glia proliferation, therefore, cannot have the significance of an essential and primary process, as is claimed by Strümpell and Müller and others, who look upon disseminated sclerosis as an endogenous primary glia sclerosis.

The changes described are a connective tissue proliferation which has arisen almost exclusively from the Schwann sheath, or the finest endoneural septa, while the larger endoneural septa and the perineurium take no share in the proliferative process. In some cases the process is so advanced as to form fibroma-like tumours, in which the Schwann sheath has formed several concentric lamellæ, the central zone of which has become hyaline. In the midst of this lamellated tissue it is possible to recognise a few axis cylinders. Schob has recognised the importance of examining the nerve roots in their longitudinal course. Several roots showed disease in their whole length: the emergent root zone showing a glious sclerosis, and the immediately adjoining tissue a connective tissue sclerosis. On the other hand, in a few roots it was recognised that the affection was strictly limited to circumscribed areas, into which one could follow non-degenerated myelinated fibres, distal to the glious root emergent zone. Only one peripheral nerve, the right crural, was preserved, and in this similar degeneration was found. In criticising such findings it is

necessary to state, firstly, that as the spinal ganglia were not preserved, the portion of nerve roots attached was short; and secondly, that the only justification for asserting the non-glial content of the tissue seems to have been that these changes affected root sections where the nerve fibres are normally surrounded by Schwann sheath. It must be remembered that the glious zone reaches for a very varying distance into both cranial and spinal nerve roots, and that one can frequently recognise glia islets appearing in a part far into the connective tissue portion of the root. It is difficult, therefore, to exclude the possibility of the glia-containing root emergent zone being primarily affected, and the possibility of secondary degeneration.

Volsch (1908) describes very minutely the changes in a case of "acute multiple sclerosis." His choice of this designation instead of acute disseminated myelitis indicates, in his opinion, both the assumption of the influence of an exogenous factor, and also the supposition that the process depends on a primary proliferative process in the glia—this process depending only in part on the direct action of the exogenous factor. The illness set in with a gradually increasing weakness of the legs, which was followed by paralysis of the abdominal muscles, flaccid paralysis of the legs, and severe decubitus: the patient died four months after the onset of the illness. The characters of the sclerotic areas, which were very numerous in both brain and spinal cord, are very similar to those previously described as typical of disseminated sclerosis. In the centre of most areas was a compact glia proliferation, surrounded by a looser glia structure, which gave an areolar appearance to the periphery. In addition to these areas, the author describes diffuse alterations in the cord, which consist of a lighter staining of the myelin, together with a marked hyperplasia of the septal glia. The vessels in these latter areas were almost normal. This diffuse septal glia hyperplasia often extended over the whole transverse section, and in Marchi-stained sections the nerve fibres showed deeply stained granules of degeneration surrounding the axis cylinder.

Volsch looks upon the typical areas as the essential substratum of the disease: they were mostly at a uniform stage of development, already far advanced, and undoubtedly owed their origin to an unknown exogenous "noxa." On the other hand, he thinks that the areas of a more diffuse gliosis are related more probably

to a much more chronic process, in which an endogenous factor—an increased tendency to glia hyperplasia—has played a part. In the brain there were no areas corresponding to this diffuse gliosis.

In a later paper (1910) Volsch returns to the question of the differential diagnosis between disseminated sclerosis and disseminated encephalo-myelitis. He states that both in acute and chronic multiple sclerosis he has found peri-vascular areas brought about directly by an exogenous "noxa," but that he cannot regard the glia hyperplasia as solely secondary and reparatory. On account both of its rapid onset and its profuseness, he assumes that the exogenous "noxa" causes nerve fibre degeneration, and at the same time stimulates the glia to proliferate. In this proliferation such an endogenous factor as a congenital predisposition of the glia to hyperplasia might play a rôle.

Oppenheim (Gustav) (1908) investigated histologically four cases of disseminated sclerosis. Successive sections of various parts of the brain and cord were stained by the various elective staining methods in order to obtain as complete and simultaneous a picture as possible of the changes in the component tissue elements. He was able to confirm the usual findings as to myelin sheath degeneration, relative integrity of the axis cylinders, and the frequent presence of fat granule cells in the sclerosis area. In three of the four cases examined there was marked plasma cell infiltration of the walls both of arteries and veins. The presence of the plasma cells the author regards as an expression of a more or less chronic inflammatory process. With the Weigert glia stain areas of a dense sclerosis were noted, together with those of a looser structure, the latter containing many large spider cells. A special study was made of the cortical areas, and those involving both cortex and subjacent white matter. While the subcortical portion of these patches presented a more or less dense feltwork of neuroglial fibres, in the cortex itself this fibre increase ceased, except in the *Randzone*, and in the ganglion cell layers only single spider cells were found. It was almost impossible to distinguish the cortical areas in the preparations stained by Nissl's and Bielschowsky's methods, on account of the persistence of the nervous elements: the glia fibril picture also was negative in the cortical area and positive in the subcortical white matter. The statements of those observers who worked with nuclear stains

alone,—before the introduction of Weigert's medullated sheath stain,—to the effect that the subcortical patches did not extend into the cortex, is thus explained. Oppenheim has found in these cortical areas, in addition to the absence of the myelin sheaths, a diffuse, excessively delicate, protoplasmic reticulum. In spite of the similarity of this network to Held's diffuse protoplasmic glia reticulum, he doubts whether it can be looked upon as exclusively of glious structure.

Benigni (1908) describes a case in which there was complete absence of any of the classical symptoms of disseminated sclerosis, except intention tremor. Sclerotic areas were found only in the spinal cord, and there was a marked alteration of the ganglion cells in the lumbar segments—an alteration *en rapport* with the muscular atrophy presented by the patient.

Schlesinger (1909) relates the case of a boy in whom the diagnosis of a typical multiple sclerosis, with subacute course, was made. The patient developed eye symptoms two weeks after an attack of measles, and died ten months after the onset of the disease. Microscopical examination revealed the presence of a very large number of larger and smaller sclerosed areas in the brain and spinal cord.

The author was able to distinguish three types of areas: (1) in a few the nerve substance had in great part perished and only a few naked axis cylinders were left. The glia was markedly proliferated, and in the areas, especially in the walls of the vessels, were numerous fat granule cells. (2) Areas of an older date, typical of the classical picture of disseminated sclerosis, with absence of myelin sheath, marked glia proliferation, and persistence of axis cylinders, but no fat granule cells. (3) Areas described as *Markschattenherde*, in which the fibre layers are distinctly evident but weakly stained. The fibres have not only a lesser staining capacity, but are frequently abnormal in appearance, being either swollen or atrophied. These areas are also circumscribed, and on each side the fibre layers resume their normal staining and character. These areas were found distributed through the whole central nervous system, but especially in pons and medulla, where they occupy a large part of the transverse section. They were looked upon as transition stages to the development of patches of true disseminated sclerosis. The presence of areas of the second and third types justified the anatomical diagnosis of subacute

multiple sclerosis, but the author regarded the areas of the first type as transitional to disseminated encephalo-myelitis.

Schlesinger also notes the finding of nephrolithiasis at the autopsy, and states that he has found this chiefly in relation to traumatic diseases of the spinal cord, and also in three cases of syringomyelia, and in three cases of encephalo-myelitis.

Marinesco and Minea (1909) have examined specially the changes in the axis cylinders in the sclerosed areas. They look upon the persistence of the axis cylinders neither as pathognomonic of, nor essential to, the picture of disseminated sclerosis. The persistence does not last indefinitely, and, therefore, there must be some secondary degeneration, but this affects not a tract nor even a bundle of fibres, but only a few groups of fibres. They regard regeneration as a necessary complement of degeneration, and by means of Cajal's and Bielschowsky's methods, they have found distinct evidence of terminal and collateral regeneration. The former is observed at the extremity of rather thick axons, but it is the collateral form which is more manifest in disseminated sclerosis. The thinness and the number of these new axis cylinders distinguish them from pre-existing collaterals of the axon.

Léjonne and Lhermitte (1909) have examined clinically and anatomically three cases of disseminated sclerosis, and give the histological analysis of one case. A young woman, twenty years of age, with the characteristic symptoms of disseminated sclerosis of five years' duration, died in hospital from typhoid fever. Plaques of sclerosis in every stage of development were found, from small inflammatory foci to old areas of neuroglial sclerosis.

In the cord the patches were quite typical: in some the vessels were apparently normal, in others they were surrounded by a proliferation of embryonic cells invading the lymphatic sheath and the vessel wall itself. In the brain, however, the picture was very variable, but in the centre of each plaque a blood-vessel was found, with embryonic cells and fat granule cells in its walls, or showing hyaline degeneration. In the areas, old and new, there was proliferation of the neuroglia with preservation of the axis cylinders. The axis cylinders were more or less hypertrophic or atrophic, but no secondary degeneration was found anywhere.

The recent areas showed typical inflammatory appearances, and all transitions could be traced to the old patches. The vessel

changes are the more pronounced the younger the areas, and the authors consider it highly probable that the plaques owe their origin to an irritative agent brought by means of the blood-vessels. Nowhere was there any evidence of thrombosis or narrowing of the lumen. They exclude the possibility of a terminal infection, pointing out that the characteristic features of the latter are not present. They believe that there is no essential and fundamental difference between disseminated sclerosis and disseminated myelitis: it is a difference in degree rather than in kind.

Lhermitte and Guccione (1909), in the historical investigation of three typical cases of disseminated sclerosis, found identical lesions affecting the blood-vessels, the neuroglia, and the axis cylinders. In the wall of the blood-vessels in recent areas there was a marked infiltration of lymphocytes and plasma cells, and in older plaques the vessel wall was thickened and hyaline. In their opinion the plasma cells in the vessel walls of the early areas develop into connective tissue cells and give rise to the fibrous thickening of the older areas. The neuroglia was studied by means of their new staining methods for glia cells and fibrils. The axis cylinders persisted in very diminished numbers, and there were marked alterations in those persisting.

In the later paper (1910) the authors review the psychic symptoms occurring in disseminated sclerosis, and relate them to anatomical alterations in the cortex.

In a further paper (1910) the authors describe specially the peri-ventricular changes found in two cases. In addition to numerous plaques in spinal cord and brain, there was marked neuroglia sclerosis of the peri-ventricular white substance. The ventricles were not dilated and the walls were of their normal smoothness. The sclerosed tissue was dense and poor in nuclei: the fibrils followed the lines of the nerve fibres, surrounding them completely. As a result, the latter were tortuous, rarefied, and moniliform; some were reduced to irregular spiral threads. The ependymal epithelium was normal, and dilated tortuous vessels, surrounded by small round cell and plasma cell infiltration, ramified through the glial tissue. A circular band of sclerosis was also found to surround the aqueduct of Sylvius, but here the ependymal epithelium was greatly modified. The writers refer to the possible pathogenic significance of these peri-ventricular lesions, and think it probable that the toxi-infectious agent whose

nature is not suggested, may diffuse through two channels: the one the more constant, represented by the blood-vessels; the other, of lesser importance, the cerebro-spinal fluid.

Merle and Pastine (1910) also refer to a case in which the ependymal and peri-ependymal change was the dominant pathological feature. They agree with Lhermitte and Guccione in regarding the existence of lesions in such a special localisation as probably of great pathognomonic significance. References are given to other cases, which show that irritation of the ventricular walls must be considered a not uncommon feature of the disease.

Weisenberg and Ingham (1910). The most interesting points of the case reported by these authors are: (1) the atrophy of the brain—rare in disseminated sclerosis—and the undoubted hypoplasia of certain parts, which is here doubtless congenital; (2) the primary degeneration of the pyramidal tracts, which is in no way related to the sclerosis; (3) the presence of developmental anomalies.

Spielmeyer (1910) has specially studied the relation between disseminated sclerosis and progressive paralysis. He distinguishes clearly between the diffuse cortical medullated fibre atrophy in general paralysis and the irregularly distributed patches which bear a striking resemblance to the cortical areas in disseminated sclerosis. He thinks that many cases of disseminated sclerosis in the intensity of their psychic disturbances bear a great similarity to the clinical picture of progressive paralysis. In general, in the latter disease there are no sclerotic patches found in the cord, but Fürstner has found, in addition to the system degeneration in the posterior and lateral columns, a more diffuse and patchy sclerosis in the cord, areas in which there was dense glia proliferation, and in the cord of the case which forms the subject of this article, Spielmeyer also found, in the lumbar cord, definite patches with all the characters of the areas in disseminated sclerosis. In sixty other cases of general paralysis he has failed to find sclerotic areas in the cord, but thinks a definite relation exists between the cortical areas in the two affections.

In a case which clinically was general paralysis, there were found two varieties of medullated fibre atrophy: (1) the usual more diffuse fibre degeneration, and (2) a local accentuated form in which spots and striæ had led to a limited demyelination of the cortex and to changes which were designated as *cortical Markfrasse.*

These spots and striæ were found most frequently in the radiations of the medullary ray, were sometimes limited to the region of the deep cortex, were sometimes in the intra-medullary cortex, and sometimes led to complete obliteration of the fibres in the cortex. The areas appeared sometimes only isolated in individual convolutions, and in other parts, especially in the anterior two-thirds of the hemispheres, were so numerous as to give the convolutions a moth-eaten appearance. In preparations stained by the Bielschowsky method it was possible to recognise where the nerve fibre lost its medullated sheath and continued non-myelinated through the area, and in preparations stained for glia and for cells, the areas were not distinctly marked out from the surrounding tissue. Only occasionally was the impression gained that the large and small spider cells were more abundant in the patches. The changes in the blood-vessels also were not more marked than in the surrounding tissue, and it was found impossible to trace any special relationship between blood-vessels and the areas. From his histological analysis Spielmeyer decided that the changes in the medullated sheath degeneration and the changes in the glia and blood-vessels in the cortex were in no sense proportionate, and in this negative finding he saw an agreement with what occurs in the cortical areas in disseminated sclerosis in which all anatomical changes in axis cylinders, cells, and glia fibres are absent.

In the form, however, of the cortical areas, there appeared in general a distinction between the areas in general paralysis and those in disseminated sclerosis. In the latter disease the areas are usually more extensive, more defined, and spread frequently from the medullary ray into the cortex. In general paralysis, on the other hand, the areas are smaller, indistinctly outlined, and often ragged, and rarely spread from white matter to cortex.

Spielmeyer has also microscopically investigated a case of Nonne's, in which during the last nine months of life there were very marked psychic anomalies. He found numerous sclerotic plaques in the latter ganglia and in the cortex, and traced a complete agreement between clinical data and anatomical findings.

Siemerling and Raecke (1911) put forward the suggestive view that underlying disseminated sclerosis there is an inflammatory process, which in its extent keeps to the distribution of the blood-vessels and leads first to the presence of capillary hæmorrhages.

In all the plaques examined the evidence of the importance of capillary hæmorrhages as the first sign of the area was very striking, then followed fibre degeneration, with a subsequent glia proliferation. Such areas, with small hæmorrhages, often lay very close together, both in brain and spinal cord, and by their confluence large irregular plaques were formed. The authors investigated seven cases of disseminated sclerosis, and, to ascertain the number and distribution of the areas, made sections through the whole cerebral hemispheres in frontal and sagittal direction. Such large brain sections revealed how varied was the distribution of the sclerotic plaques: in three of the cases only the white matter of the brain was affected, and in two cases, in which psychic affections were marked, the plaques were prevailingly in the cortex. In the cortical areas the wedge-form, with base on the surface of the convolution, was most frequent, and over these areas the pia was thickened and infiltrated with round cells. In all the cortical areas the tangential and supraradial fibres were involved, and in almost all a blood-vessel or blood pigment was the central point of the area.

Flatau and Koelichen (1902-1911) describe a case of disseminated sclerosis which had clinically strongly simulated subacute transverse myelitis in the lumbo-sacral region of the cord, without any cerebral symptoms. Death occurred three and a half months after the onset of the disease. There were no macroscopical alterations in the brain or spinal cord. Numerous sclerotic areas were found throughout the whole length of the cord. These were divided into two groups: (1) those in an early stage of myelin sheath degeneration, without participation of the blood-vessels or glial tissue; and (2) further advanced areas with accumulation of fat granule cells in the vessel walls and glial proliferation. The whole of the lumbo-sacral cord was in a condition of advanced degeneration. In all the areas the participation of the vessels in the sclerotic process was quite evident, and the authors regard the vessel alterations as the key to the whole process. Disseminated sclerosis is looked upon as essentially a disseminated inflammatory process, *i.e.*, a disseminated myelitis, with, however, certain special characteristics. The inflammatory changes are assumed to be not so intense as in myelitis, and, therefore, there are no "softenings" in the usual sense of the term.

In their later paper Flatau and Koelichen again discuss the

relation of disseminated encephalo-myelitis to disseminated sclerosis. They think that the infectious or exotoxic origin can be admitted for those cases of disseminated sclerosis running an acute course, but that the pathogenesis of most of the cases with a chronic course must be different, and is probably related to an autogenous toxin. Whether the supposed toxin forms in the body, and whether disturbed metabolism or an altered internal secretion plays a part, is not stated. As in their earlier paper, the authors see in disseminated sclerosis a chronic irritative process of the whole central nervous system—a process which has acute exacerbations, and which, in the majority of cases, is dependent on autogenous intoxication.

Nonne (1911) has made a careful clinical and serological investigation into the phenomenon of inhibition of cobra poison hæmolysis. He has investigated all possible cases of organic disease of the central nervous system, and has also made very numerous control tests. He feels justified in stating, yet with a certain amount of reserve, that the cobra reaction is specially frequent in degeneration-neuroses and psychoses, and in hereditary diseases in the neuro-psychopathic sense. In the katatonic group also, and in the group of maniac-depressive psychoses, and in the chief representatives of endogenous psychoses, the reaction is likewise very frequent. Amongst organic diseases of the central nervous system the reaction appears most frequently in disseminated sclerosis. In healthy individuals the authors found the reaction in 5 per cent., in people with diseases other than of the nervous system in 15 per cent., in psychoses in 65 per cent., and in disseminated sclerosis in 65 per cent. As the reaction appears even in the early stages of disseminated sclerosis, Nonne is tempted to value it as a differential diagnostic sign, especially as the Wassermann reaction, the globulin reaction, and the cytological examination of the cerebro-spinal fluid in disseminated sclerosis give no indication of the disease. He thinks that as these very psychoses which are claimed as types of endogenous etiology are marked by the presence of cobra reaction, the fact of its presence in disseminated sclerosis appears to support the view of the endogenous nature of this disease, especially as it is very seldom observed in acquired disease of the nervous system, with the exception of general paralysis.

Robertson (1912) records a case of disseminated sclerosis which

is of special interest on account of the presence of hydromyelia, interstitial neuritis in several peripheral nerves, and changes in the posterior root ganglia, which suggested a chronic inflammatory condition. The absence of some of the characteristic features of disseminated sclerosis, *e.g.*, nystagmus, scanning speech, intention tremor, &c., is explained by the author by the fact that the sclerosis had confined itself chiefly to the cord, the medulla and pons being only slightly affected, and the cerebrum and cerebellum scarcely at all. The presence of a hydromyelia is interesting in view of the theory that disseminated sclerosis is a multiple gliosis, but the author thinks that the cavity formation might as truly occur in glial tissue, formed as a result of chronic irritation, as in that resulting from congenital abnormality, and that the well-marked interstitial peripheral neuritis lends support to the view of the chronic toxæmic nature of the disease. The appearances of the posterior root ganglia would also accord with this view. There were no degenerative changes in the walls of the blood-vessels but there was evidence of a cellular reaction in their adventitia.

Wohlwill (1913) has given a short review of the recent literature on disseminated sclerosis. The pathological anatomy, pathogenesis, and etiology are carefully discussed, and various etiological factors are submitted to a close examination. The conclusion is reached that histological investigation has advanced in the direction of harmonising our ideas as to the exogenous nature and vascular origin of the disease, but that we are still far from determining its real nature.

(*Part III. will appear in the December Number.*)

Abstracts.

ANATOMY.

A STUDY OF A PLAINS INDIAN BRAIN. J. J. KEEGAN, *Journ.* (454) *Comp. Neurol.*, 1916, xxvi., Aug., pp. 403-420 (8 figs.).

THIS Indian brain represents in practically all features a high type of cerebrum, the only possible exceptions being the shallow communication of the incisura rhinalis with the sulcus collateralis, and the presence of a typical sulcus lunatus in the left hemisphere.

The great asymmetry of the two hemispheres in fissuration is the most convincing evidence of a highly specialised cerebrum. Future combination of physiological observation with cerebral morphology will undoubtedly lead to a better interpretation of such variations.

The comparison of cerebra of different individuals should take into consideration this relation of asymmetry to functional localisation, and should be confined to hemispheres of the same side in individuals of as near similar mental traits as possible.

The method of plotting the cortical areas established by Elliot Smith, although inaccurate in many details, aids greatly in the interpretation of fissures and in the comparison of the development of different areas. It serves as the most expressive manner in which the morphology of cerebra can be presented for comparison. A. NINIAN BRUCE.

ABSENCE OF CHROMATOLYTIC CHANGE IN THE CENTRAL (455) **NERVOUS SYSTEM OF THE WOODCHUCK (*MARMOTA MONAX*) DURING HIBERNATION.** A. T. RASMUSSEN and J. A. MYERS, *Journ. Comp. Neurol.*, 1916, xxvi., Aug., pp. 391-402 (6 figs.).

THE nerve cells of the woodchuck are essentially typical, containing the usual large round nucleus, with one nucleolus. The Nissl granules have the usual appearance and arrangement.

The authors were quite unable to detect any modification in the Nissl granules characteristic of the hibernating as compared with the non-hibernating state. A. NINIAN BRUCE.

A PRELIMINARY DETERMINATION OF THE PART PLAYED
(456) **BY MYELIN IN REDUCING THE WATER CONTENT OF THE MAMMALIAN NERVOUS SYSTEM (ALBINO RAT).** H. H. DONALDSON, *Journ. Comp. Neurol.*, 1916, xxvi., Aug., pp. 443-451 (1 chart).

THERE is no evidence that the cell bodies and their unsheathed axons suffer more than a slight loss of water between birth and maturity, and that the progressive diminution in the water content of the entire brain and spinal cord is mainly due to the accumulation of myelin, with a water content of about 48 per cent. As the diminution in the percentage of water in the central nervous system is pre-eminently a function of age, and as it appears to be due almost entirely to the formation of myelin, it follows that the myelin formation is also a function of age. A. NINIAN BRUCE.

CHANGES IN THE ROD-VISUAL CELLS OF THE FROG DUE
(457) **TO THE ACTION OF LIGHT.** LESLIE B. AREY, *Journ. Comp. Neurol.*, 1916, xxvi., Aug., pp. 429-442 (2 figs.).

DISTINCT movements of the nuclei of the red rod-visual cells, due to photic stimulation, are not demonstrable. Hence movements of the rods are not produced indirectly in this way. The myoid of the rod-visual cell elongates in light and shortens in darkness. Therefore, contrary to the conclusions of the older workers, the photo-mechanical response of the frog's rod myoid is found to be similar to that occurring in the retinas of all other investigated vertebrates. The mean length of approximately 1000 myoids from 23 light-adapted retinas is 11·6μ. The mean length of approximately 1000 myoids from 23 dark-adapted retinas is 5·9μ. A. NINIAN BRUCE.

THE INFLUENCE OF LIGHT AND TEMPERATURE UPON THE
(458) **MIGRATION OF THE RETINAL PIGMENT OF PLANORBIS TRIVOLVIS.** LESLIE B. AREY, *Journ. Comp. Neurol.*, 1916, xxvi., Aug., pp. 359-389 (9 figs.).

LIGHT causes the retinal pigment of normal Planorbis (a pulmonate gasteropod) to migrate distally (towards the source of illumination). Darkness causes a proximal migration. About four hours is necessary for the pigment to assume the distribution characteristic of light adaption, whereas about five hours is demanded in accomplishing the reverse process of dark-adaption. The pigment of dark-adapted, excised eyes exhibits migratory movements when exposed to light, and is, therefore, capable of direct stimulation. In the converse treatment (light to dark) in excised eyes no change in the position of the pigment occurs.

High temperature (30° C.) induces proximal migration of the normal retinal pigment both in darkness and in light. Low temperature (3° C.) induces distal migration both in darkness and in light. Upon light-adapted excised eyes, low temperature likewise favours proximal migration, and high temperature favours distal pigment migration.

The adaptional significance of the existence of mobile pigment in the retina of Planorbis is quite obscure.

A. NINIAN BRUCE.

PHYSIOLOGY.

AN EXPERIMENTAL STUDY OF THE VAGUS NERVE. MARTIN
(459) R. CHASE, *Journ. Comp. Neurol.*, 1916, **xxvi.**, Aug., pp. 421-428 (4 figs.).

SECTION of the cervical vagus nerve in the dog, with or without section of the sympathetic trunk, is followed by complete degeneration of all fibres of the vagus, both myelinated and unmyelinated. There are to be found in the degenerated thoracic trunk, above the level of the pulmonary plexuses, in some individuals bundles of unmyelinated nerve fibres having their origin in the cells of the sympathetic, presumably in the inferior cervical ganglion. In some individuals no bundles of this sort are found. In no case does the total number of fibres of sympathetic origin present amount to more than an insignificant fraction of the total number of unmyelinated fibres normally present.

The unmyelinated character of the thoracic vagus nerve in the dog is not due to the presence of fibres derived from the sympathetic trunk during the close association of the vagus and sympathetic nerves in the neck. A. NINIAN BRUCE.

NOTES ON THE FALLING REFLEX OF CATS. HENRY R. MULLER
(460) and LEWIS H. WEED, *Amer. Journ. of Physiol.*, 1916, **xl.**, May, p. 373.

ALL normal cats fall squarely on their feet when dropped, back downwards, from a height of twelve inches from the floor, some from even as little as six inches. "The rotation of cats on falling seems to depend on excitations derived either from the eyes or from the semicircular canals. Loss of either of these organs of initial spatial relationship does not interfere with the falling reflex, but deprivation of both these sensory fields abolishes this reflex. This rotational reaction also seems dependent on some cortical influence (consciousness ?), although it occurs after

ablation of both motor areas. Decorticated (without cerebral hemispheres) and decerebrated animals do not, in our experience, show the slightest tendency towards rotation in the air. The rotation may be accomplished by the cat when deprived of the pyramidal tract by extirpation of the motor cortex." The writers conclude that the falling reflex is probably an acquired form of protective mechanism, dependent on influences from the semicircular canals and from the eyes, mediated largely, if not entirely, through the cerebral cortex. LEONARD J. KIDD.

UNILATERAL DESTRUCTION OF THE SEMICIRCULAR CANALS IN CATS. (461) HOMER G. FISHER and HENRY R. MULLER, *Amer. Journ. of Physiol.*, 1916, xli., Sept., p. 267.

"CATS, subjected to a unilateral destruction of the semicircular canals, show the following typical responses:—

"1. During the first twenty-four hours there results a marked horizontal nystagmus to the opposite side; a varying degree of ataxia of the whole body, especially of the head; and a typical rotation of the head, with depression of the ear on the operated side.

"2. With the loss of the nystagmus after about thirty hours, and a loss of the tendency to walk in a circle after a few days, there is a very gradual but incomplete recovery of the postural and muscular reactions of the animal.

"3. On being dropped in the air, the tendency of these animals is to rotate away from the lesion, and to land accurately on their feet.

"4. Blinded cats with one-sided vestibular lesions show after the first twenty-four hours an inevitable tendency towards rotation away from the lesion about the long axis of their bodies. Such rotations have been observed to continue through 720 degrees. Similarly, unblinded cats, when placed in water, and with their heads submerged, continuously rotate around the long axis of their bodies.

"5. All the rotations, whether falling to the injured side while walking, or rotating while dropping through the air, or rotating while submerged in water, all take place in the same direction around the long axis of the body—to the right in cats with the lesion on the left side, and to the left in those with right-sided lesions." LEONARD J. KIDD.

THE TASTE OF ACIDS. W. J. CROZIER, *Journ. Comp. Neurol*, 1916, (462) xxvi., Aug., pp. 453-461 (2 figs.).

AN attempt is here made to account for the action of acetic and hydrochloric acids upon the sense of taste. It is shown that the

stimulus due to these substances probably depends upon their union with diverse constituents of the ceptor surface. It is thus possible to explain, by comparison with the penetration of cells by these acids, how they stimulate at all, why they stimulate to different degrees, and why acetic acid gives a more powerful stimulus than if it acted by dissociation alone. Why these acids produce a unitary (sour) taste quality is a problem of a different order; it is possible that this depends upon the presence of potentially ionizable hydrogen within undissociated acid molecules, though secondary ionization may also play a part.

A. NINIAN BRUCE.

STUDIES OF THE CONDITIONS OF ACTIVITY IN ENDOCRINE
(463) **GLANDS. I. The electrical response as an index of glandular action. II. The secretory innervation of the thyroid gland. III. The influence of the adrenal secretion on the thyroid.** W. B. CANNON and M'KEEN CATTELL, *Amer. Journ. of Physiol.*, 1916, xli., July, pp. 39, 58, 74.

"I. A METHOD is described for registering the excursions of a d'Arsonval galvanometer, while permitting direct observations of the deflection on the scale.

"Because (1) an electrical change accompanies secretion of saliva, even though the blood supply is shut off from the gland, or the flow through the duct is stopped; and because (2) the change is absent when secretion is absent, although each of the conditions attendant on secretion—as contraction of blood vessels, relaxation of blood vessels, faster flow of blood, slower flow of blood—may severally be induced, the conclusion is drawn that the electrical change is a manifestation solely of the secretory process.

"When the action current indicates a maximal activity of the submaxillary gland, excited by sympathetic impulses, the electrical response can be augmented by chorda impulses, and vice versa; sympathetic impulses are ineffective during the height of an adrenin effect, and chorda impulses cause no increase while pilocarpine is strongly operative.

"The direction of the action current from the submaxillary gland may be reversed, although the physiological response to stimulation remains as usual. Reversal is therefore not a sign of a reversed process in the gland." Cats were used in this research.

II. The writers conclude that the non-medullated nerves distributed to thyroid cells belong to the sympathetic and not to the cranial division of the autonomic system, that their effects are not indirect through alterations of blood supply, but that they

are indeed true secretory nerves. The arguments against this conclusion are discussed.

III. The writers find that injections of small doses of adrenalin (0·1 to 0·2 c.c., 1·100,000) evokes in the cat an action current of the thyroid gland.

"Stimulation of the splanchnic nerves, physiologically separated from the central nervous system, likewise evokes an action current of the thyroid gland. This electrical change does not occur if the return of blood from the abdomen is prevented, but takes place promptly when the pent blood is released. The change also fails to appear after splanchnic stimulation if the adrenal glands have been previously removed." LEONARD J. KIDD.

THE DUCTLESS GLANDS AND HIBERNATION. FRANK C. MANN, (464) *Amer. Journ. of Physiol.*, 1916, xli., August, p. 173.

THE writer obtained the following results from his observations on gophers (*spermophilus*):—(1) The sex glands undergo a definite seasonal variation, but certainly do not play any part in the cause of the hibernating state, or undergo any specific changes due to the torpid condition. (2) No changes could be determined in the thyroids of the hibernating animal, and the fact that animals in which the thyroids were removed hibernated normally, tends to show that these glands are not factors of significance in hibernation. (3) The very slight and inconstant changes noted in the parathyroids do not warrant any positive conclusion. (4) The thymus does not appear to undergo any uniform change. (5) The islands of Langerhans undergo changes so slight as not to justify a positive conclusion. (6) The adrenals undergo a fairly definite seasonal variation. The different changes are most marked during the winter and during the period of rut. However, the adrenals do not appear to be a specific factor in hibernation, because the same changes were noted in animals sacrificed during the winter which had not been allowed to hibernate, and removal of the adrenals, which certainly reduces the adrenal substance to a minimum, did not in any way change the hibernating ability of the animal. (7) Some of the pituitary glands of the hibernating animals showed definite changes, but these changes were not constant.

The writer concludes that we cannot affirm that some of the ductless glands are not of importance in relation to hibernation. New methods of investigation may demonstrate this relationship. "However, the results of this study do not justify the assumption of any theory ascribing the phenomena to a lack of function of all or any one of the ductless glands." LEONARD J. KIDD.

THE GROWTH OF THE BODY AND ORGANS OF THE ALBINO RAT AS AFFECTED BY FEEDING VARIOUS DUCTLESS GLANDS (THYROID, THYMUS, HYPOPHYSIS, AND PINEAL). E. R. HOSKINS, *Journ. of Exper. Zool.*, 1916, xxi., Oct., p. 295.

(465)

THE normal growth of the albino rat varies materially, even among litters kept under conditions as nearly constant as possible; in all cases experimental and control animals must be selected of the same sex, and from the same litter or litters.

There is apparently no sexual difference in the relative weight of the pineal body, such as has been found in the adrenals by Jackson and by Hatai, and in the pituitary by Hatai.

Thyroid feeding, in sub-toxic doses, causes little or no change in body weight in growing rats. Thyroid feeding produces a decided hypertrophy of the heart, liver, spleen, kidneys, and adrenals (especially in males); and a less extensive and more uncertain increase in the weights of the alimentary canal and pituitary (male), and possibly in the skeleton, testes, and epididymis; and a decrease in weight of the female pituitary.

Feeding with sub-toxic doses of thymus, pituitary, and pineal had no definite constant effects on body growth or any of the organs or parts. The testes of thymus-fed rats showed no degenerative or other changes. (The paper is a very full one, with much statistical matter.) LEONARD J. KIDD.

LIPASE STUDIES: IV. ON REGIONAL LIPOLYTIC ACTIVITY IN THE NORMAL HUMAN BRAIN. CLARENCE QUINAU, *Journ. Med. Research*, 1916, xxxv., Sept., pp. 79-86.

(466)

ALL normal brain structures, both grey and white, are able to accelerate the hydrolysis of ethyl butyrate. Tests of brain substance by weight show that each main histological subdivision gives a constant and characteristic lipolytic value. All regions of the cerebral cortex are nearly alike in activity, but the values increase slightly from before backward. The motor area of the anterior central gyrus shows no greater activity than other parts of the cortex. The grey matter of the cerebellum is very active lipolytically, and in this respect it is the dominant intra-cranial structure. The white matter of the corpus callosum and the centrum semi-ovale are alike in lipolytic activity, but are very much less active than the different grey masses. It is suggested that the regional differences are due to variations in the structural elements. A. NINIAN BRUCE.

PATHOLOGY.

THE ORGANIC DEPRESSION OF THE NERVE CELL PRODUCED
(467) **BY PROLONGED ETHER ANÆSTHESIA.** EVERETTE E. BUTLER, *Journ. Med. Research*, 1916, xxxiv., July, p. 325.

ETHER anæsthesia produces certain definite anatomical changes in nerve cells of dogs. The changes are just those of mild activity, and later there are superimposed changes of depression, depending in severity upon the duration of the anæsthesia. The changes of depression first make their appearance microscopically in about two hours. Anæsthesia of two to six hours produces a moderate depression, one up to eight hours a marked depression, and one of more than eight hours a profound depression, with the beginning of necrobiosis.

The severity of the anatomical changes in the nerve cell appears to be in direct relation to the length of the anæsthesia, allowance being made for individual variations. The changes vary in degree in animals of the same species, kept under the same form of anæsthesia for the same length of time. An anæsthesia of several hours' duration for several successive days produces almost the same degree of depression in the nerve cells as a continuous one of the same number of hours.

Animals which are easily kept anæsthetised show more marked anatomical changes in the nerve cells than animals that are kept under the anæsthesia with difficulty, when the time length and the kind of anæsthesia are the same. A state of collapse results from ether anæsthesia of eight or more hours' duration. This state of collapse is coincident with profound depression, and is considered to represent the end constitutional effect of a diffusely acting depressant. A. NINIAN BRUCE.

CLINICAL NEUROLOGY.

BABINSKI'S SIGN FROM THE POINT OF VIEW OF COMPARA-
(468) **TIVE ANATOMY.** M. ASTWAZATUROF, *Brit. Med. Journ.*, 1916, August 12, p. 219.

THE lower extremity of man is evolved from an extremity with the function of grasping. In this act the movement of the first toe is one of opposition, which movement has been lost in the transition from the grasping function to the static function. In man the opponens hallucis is absent, and the first metatarsal bone lies parallel with the other metatarsals, while in the other primates it is at an angle with the others. For the act of walking the function of synergic flexion of all five toes is necessary. This is

absent in a young child, but develops gradually in learning to walk. In man the function of synergic flexion of the five toes is not an inherited capacity, but a special adaptation of the neencephalic elements, and a result of cortical influence. The normal reflex, synergic flexion of all the toes is a function of the cortex, and where the spine is separated from the cortex this reflex is lost. In such cases the impulses from the sole spread only to segments to which they used to go when there existed no special cortical mechanisms for synergic flexion of all five toes. The function in man nearest to this normal reflex is the grasping function observed in other primates. So in pyramidal lesions the impulses brought about by irritation of the sole must spread to the centres to which they used to spread when the function of the foot was a grasping one. Thus they spread to the flexors of the second, third, fourth, and fifth toes. As regards the first toe, the opponens muscle being lost, no reaction would take place. This reflex, seen in the second, third, fourth, and fifth toes, is considered as a pathological sign, and is observed in some cases of pyramidal lesion.

In regard to the extension of the great toe, this is brought about by the extensor longus muscle. In the evolution of the foot from a grasping function to a purely static one, there was a time when the flexor act was confined to the second, third, fourth, and fifth toes, the great toe during this act being extended. In the Western monkeys—Hapalidæ—it is found that all the digits except the first have claws, the first toe having a nail and not being opponible. This shows that in the evolution of the static function the great toe has lost its grasping capacity earlier than the other toes, and the grasping act being confined to them, it was necessary to remove the first toe from them, and this could be done only by its extension. In Babinski's sign we probably have a rudiment of this condition.

The *signe d'éventail*, which consists in the spreading out of the toes, is sometimes seen in pyramidal lesions, and it is a phenomenon observed in young children. It can be explained as a rudiment of mobility of the toes which existed in the grasping evolution of the foot. It may be a rudiment of "showing the claws" act. R. Dods Brown.

SOME REMARKS ON THE DEFENCE REFLEXES CALLED (469) **"MEDULLARY AUTOMATISM." (Quelques remarques sur les réflexes de défense dits "d'Automatisme Médullaire.")** J. Jarkowski, *Rev. Neurol.*, 1916, xxiii., Jan., p. 34.

A general discussion of the subject upholding the use of the term "medullary automatism," and showing that the defence reflexes closely resemble voluntary movements. D. K. Henderson.

INTERESTING PHENOMENON OF AUTOMATISM OCCURRING
(470) **AFTER MUSCULAR EFFORT IN HEALTHY SUBJECTS.**
(D'un intéressant phénomème d'automatisme qu'on remarque après les efforts musculaires chez les sujets sains.) ALBERT SALMON, *Rev. Neurol.*, 1916, xxiii., Jan., p. 27.

THE author has studied an interesting automatic phenomenon which occurs in healthy persons after prolonged and severe muscular work. The patient is asked to forcibly and steadily abduct his arm or arms, whilst at the same time the movement is strongly opposed; when the patient has been gradually fatigued he is asked to relax the contracted muscles and to outline, for a moment, the movement preceding abduction. Just at the commencement the patient will be seen, independently of his will, to raise his arm or arms in an automatic manner. After very forcible flexion of the forearm or thigh, or after extension of the head, this same phenomenon may be seen. In general it may be said that it has been found to be exaggerated in emotional, nervous, and hysterical subjects, and is diminished in apathetic subjects, in old people, and in disorders which show a considerable diminution in affectivity.

The phenomenon does not occur usually in cases of hemiplegia, as they are unable to make sufficient muscular effort for its realisation. Interesting observations are also recorded in regard to two cases of cerebro-spinal syphilis. The phenomenon is regarded as being of cortical or kinesthetic origin, and psychologically is interesting in regard to the general laws of automatism.

D. K. HENDERSON.

CONTRIBUTION TO THE STUDY OF THE ACHILLES REFLEX.
(471) **(Contribution à l'etude du réflexe Achilléen.)** FONSECA SOBRINHO, *Rev. Neurol.*, 1916, xxiii., Jan., p. 38.

A COMPARATIVE study of the Achilles reflex elicited by tapping the tendon and the muscle mass of the gastrocnemius. Patients suffering from various forms of general diseases, and also from various forms of disorder of the central nervous system, have been examined.

The Achilles reflex obtained by tapping the tendon is independent of that obtained by percussion of the muscle mass; the tendon reflex may be present when none is obtained by percussion of the muscle, and vice versa. Exceptionally both may be absent.

D. K. HENDERSON.

THE "SIGN OF THE STERNO-MASTOID," A SYMPTOM OF BULBO-MEDULLARY IRRITATION. (Le "signe des sternos" symptome d'irritation bulbo-médullaire.) ROGER DUPOUY, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 951.
(472)

THIS is a contraction of the sterno-mastoid produced by tapping the nape of the neck. Dupouy has found it in all cases of meningitis he has examined, in incipient general paralysis, in a case of disseminated sclerosis, and in an epileptic emerging from a severe fit. It is absent in hysteria, and so is a useful sign. A light tap produces it, so the reflex is not due to the shock imparted to the third cervical spine, and it is not purely cutaneous in origin. Dupouy considers it due to indirect stimulation of the eleventh nucleus, and a sign of bulbo-medullary irritability.

H. W. HILLS.

A CROSSED HIP REFLEX IN ENTERIC FEVER. E. B. GUNSON, *Lancet*, 1916, Sept. 16, p. 520.
(473)

THE author has previously referred to this reflex as occurring in a case of cerebral tumour, various cerebro-spinal conditions, and diphtheria.

When the quadriceps femoris muscle is firmly grasped above the knee between the thumb and fingers, the patient experiences pain at the site of stimulation, and there occurs flexion at the hip joint, and extension of the great toe of the opposite limb. The reflex may be incomplete. Of thirty-seven patients examined, the complete reflex was present on one side in four cases, while an incomplete response was obtained in nine. The presence of this sign is held to signify a "temporary perturbation" of the spinal cord, the result of a toxic or inflammatory process.

R. DODS BROWN.

THE CLINICAL VALUE OF DEFENCE AND MUSCLE REFLEXES. IMPORTANCE OF THE LATTER IN SPINAL LOCALISATION. T. H. WEISENBURG, *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 217.
(474)

EXAGGERATED muscle reflexes are constantly present in pyramidal lesions, and are of equal importance with increased tonicity and increased tendon reflexes. In spinal localisation they are of value, for in destructive lesions they are either absent or diminished in the peripheral area corresponding to the lesion. In such cases the muscle jerks may be increased just above the lesion, but are always exaggerated in the parts of the body below the lower limit of the lesion, even though the skin and tendon reflexes are diminished or lost. In incomplete lesions of the spinal cord the

muscle reflexes are exaggerated up to the upper limit of the lesion. In a gradually extending upward paralysis, such as is produced by a pressure myelitis, the exaggeration of the muscle reflexes keeps pace with the increase of the paralysis, and is an indication of an extension of the lesion. Finally, the most important conclusion that can be drawn is that the exaggeration, and more especially the absence of a muscle reflex, is an indication of the state of the reflex arc in the spinal segment corresponding to that particular muscle. A. NINIAN BRUCE.

"HYPERÆSTHESIA SIGNIFIES ALWAYS HYPERALGESIA."

(475) **("Hyperesthésie" signifie toujours hyperalgésie.)** HENRI PIÉRON, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 947.

IT is possible to dissociate even the algesias, and there may occur simply mechanical hyperalgesia without even thermal hyperalgesia, much less an exaggeration of all the cutaneous sensibilities. The writer considers that pain sensibility alone can be made pathologically more delicate; in fact, if all kinds of sensibility can be diminished, only the threshold for pain stimuli can be lowered.

H. W. HILLS.

CLINICAL STUDIES ON FARADO-CUTANEOUS PAINFUL

(476) **SENSIBILITY. (Recherches cliniques sur la sensibilité douloureuse farado-cutanée.)** E. CARATI, *Rev. Neurol.*, 1915, xxii., May and June, p. 296.

THE most important conclusions are:—

1. The faradic current is a very exact means of studying the cutaneous pain sense.

2. The zones of altered sensibility are always (and often much) more extended than the hypæsthetic, anæsthetic, and hyperæsthetic zones of other modes of testing sensibility.

3. Sometimes tactile hyperæsthetic and pain zones are only slightly sensitive to the faradic current. D. K. HENDERSON.

TWO CASES OF HERPES ZOSTER ASSOCIATED WITH A

(477) **GENERAL ERUPTION OF VARICELLA-LIKE SPOTS: One of the cases followed by oculo-motor paresis, mydriasis, and frontal anæsthesia. With a short analysis of the literature of the subject, and remarks on the ætiology of herpes zoster.** F. PARKES WEBER, *Brit. Journ. Derm.*, 1916, xxviii., p. 13.

THE first patient was a man, aged 59, and the second a woman aged 60. J. D. ROLLESTON.

HERPES RECURRENS. H. G. ADAMSON, *Brit. Journ. Child. Dis.*, (478) 1916, xiii., p. 193.

AFTER alluding to the frequency of herpes febrilis in various acute infectious diseases (*v. Review*, 1907, v., p. 906, and 1910, viii., p. 757), Adamson records several personal cases of recurrent herpes of the cheek, gluteal region, neck, wrists, and fingers.

J. D. ROLLESTON.

A REVIEW OF 127 CLINICAL CASES OF ATAXIC PARAPLEGIA.
(479) G. H. BIGELOW, *Boston Med. and Surg. Journ.*, 1916, clxxv., p. 99.

OF 127 cases of ataxic paraplegia treated at the Massachusetts General Hospital from 1903 to 1915, 70 per cent. were males, though in the whole out-patient department only about 58 per cent. were males. In 83 cases a possible etiology was found. The chief causes were:—Syphilis, 43; accidents, 10; acute infection, 6 (diarrhœa, grippe, rheumatic fever, typhoid, infectious arthritis, and meningitis); and alcoholism, 5. In 44 cases no possible etiology could be discovered. 112 cases, or 88·3 per cent., complained of objective and subjective disturbances in the legs; the remaining 11·3 per cent. complained of urinary disturbances, paræsthesia, or weakness in the arms, dizziness, headache, &c. The predominant symptoms were as follows:—Spasticity, 52; ataxia, 48; paræsthesia, 9; bladder symptoms, 3; flaccidity, 3.

J. D. ROLLESTON.

RECURRENT POLIOMYELITIS: SECOND ATTACK AFTER A
(480) **PERIOD OF THREE YEARS.** E. W. TAYLOR, *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 207.

IN general it may be concluded that an attack of poliomyelitis in the great majority of cases confers a lasting immunity; that it is definitely established that exacerbations or relapses may occur at short intervals of time after the primary onset; and that evidence is accumulating to show that an actual second attack, with re-infection from an external source, may and probably does occur in rare instances.

A case is here described in a boy, aged 7 years. The first attack affected the right leg and left arm. The left arm quickly recovered, but the right arm remained affected. The second attack occurred three years later. It ran quite a different course, paralysed all voluntary movements, and improvement was slow, it being six months before he could walk again.

Numerous references to the literature are quoted.

A. NINIAN BRUCE.

THE PARALYSIS OF POLIOMYELITIS: Its treatment in the early stages. (481) H. B. THOMAS, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 23, p. 949.

WEAK and paralysed muscles are sick muscles with deranged nerve and blood supply, and should be treated as such. Sick muscles tire easily, not only by active use, but also by passive use and by massage, and when they tire they are less able to functionate the following day. Their ultimate usefulness is also harmed. The results of treatment should be closely followed, and under-treatment is always better than over-treatment. Especially must fatigue be avoided.

A. NINIAN BRUCE.

INFLUENZAL MENINGITIS, WITH REPORT OF A CASE. (482) ROBERT G. TORREY, *Amer. Journ. Med. Sci.*, 1916, clii., Sept., p. 403.

A GIRL, aged 11, had a severe attack of influenza with a frontal sinus infection, followed by typical cerebro-spinal meningitis. The organism isolated from the case showed a low degree of pathogenicity when tested by injection into rabbits. The spine was tapped thirteen times, and the influenzal organism was present in pure culture up to the last two tappings. There was an improvement of the symptoms following each tapping, both when the serum was used and when it was not employed. The fluid became more turbid following the first injection of anti-meningococcic serum. Wollstein's anti-influenzal serum was then repeatedly injected, and although it was followed by agonizing pain, it ultimately resulted in recovery, the organisms disappeared from the fluid, the temperature returned to normal, and the stiffness of the neck, which was the last remaining symptom, gradually disappeared.

A second case in a boy, aged 8 months, is described. There was no phagocytosis in the spinal fluid, and the case ended fatally.

A. NINIAN BRUCE.

PNEUMOCOCCAL MENINGITIS, WITH RECOVERY, FOLLOWING VACCINE THERAPY. (483) A. C. BROWN, *Lancet*, 1916, Sept. 16, p. 519.

THE illness, in the case of a bricklayer, began with headache and nasal catarrh, and was followed by a rise of temperature, quick pulse, stiff and somewhat retracted neck, with well-marked Kernig's sign. "Sores" about nostrils and lips and in the mouth were present. The man was just conscious, but irrational and very restless. An injection of anti-meningococcal serum was administered, and lumbar puncture was performed. Examination

of the fluid revealed pneumococci. The patient apparently became acutely delirious and difficult to manage. Pneumococcal vaccines were given, five injections in all being administered. The acute phase lasted three weeks. Patient made a good recovery.

The author considers—(1) That there has been an increase in all forms of meningitis, and not only in that due to the meningococcus. (2) That this increase is due to the "general upheaval of the population," whereby more susceptible individuals are brought into contact with carriers of the disease. (3) That all forms of meningitis should be made compulsorily notifiable.

R. Dods Brown.

STAPHYLOCOCCAL CEREBRO-SPINAL MENINGITIS AND SEPTICÆMIA. (Méningite cérébro-spinale et septicémie staphylococciques.) (484) G. Etienne and A. Grosjean, *Progrès Méd.*, 1916, p. 129.

A FATAL case in a man, aged 46, in whom suppurative meningitis occurred as a local complication of a primarily septicæmic infection. The course of the septicæmia resembled that of the cases of tetragenus infection recorded by Ramond and Résibois (*v. Review*, 1916, xiv., p. 42), and others, but in the present case the causal agent was staphylococcus albus.

J. D. Rolleston.

ZOSTERIFORM ERUPTIONS AS AN EPISODE IN SYPHILITIC MENINGITIS. (Les éruptions zostériformes épisodiques au cours des méningites syphilitiques.) (485) M. Bloch and E. Schulmann, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 1012.

In addition to ordinary herpes zoster, syphilitic patients may develop a specific zoster at various stages of the infection. First it may be the result of a primary localisation of the spirochæte in the posterior ganglia. More frequently it heralds an early latent meningitis in the secondary period. Later, it may sometimes reveal the extension of the process of meningitis to the region of the posterior ganglia. At this stage it is a valuable indication of a commencing tabes or general paralysis (*v. Review* 1911, ix., p. 260). Five illustrative cases are recorded.

J. D. Rolleston.

EXPERIMENTAL TUBERCULOUS MENINGITIS. (486) C. R. Austrian, *Johns Hopkins Med. Bull.*, 1916, xxvii., p. 237.

Austrian conducted experiments on 35 rabbits, 20 of which he inoculated with the bovine type of bacillus, and 15 with bacilli of the human type, by injections of suspensions of the bacilli

into the spinal canal. A fairly typical clinical meningitis resulted after an incubation period of from 8-15 days. The duration of the disease varied from 9-24 days in the cases due to the bovine bacillus, and from 16-28 in those due to the human type. In both types of infection the result was fatal. Death was not prevented by the intraspinous injection of albumose-free tuberculin, tuberculinised serum, the serum of tuberculous rabbits, or a suspension of rabbit's leucocytes. J. D. ROLLESTON.

(487) **NOTE ON THE VALUE OF HEXAMINE IN AURAL SUPPURATION AND IN MENINGITIS.** DOUGLAS GUTHRIE, *Brit. Med. Journ.*, 1916, Sept. 30, p. 455.

HEXAMINE (urotropin) given by mouth has been stated to have been detected in the cerebro-spinal fluid one hour later, and being antiseptic has been suggested as useful in middle ear suppuration and meningitis. It has, however, no antiseptic action unless the medium be acid.

The author examined four cases of suppurative otitis media and two cases of meningitis, and although in two of the cases symptoms of intolerance appeared, no trace of hexamine (or its decomposition product, formaldehyde) could be found in the aural discharge or in the spinal fluid, although present in the urine in all six cases. A. NINIAN BRUCE.

(488) **A CASE OF MALARIAL ENCEPHALOPATHY. (Un caso de encefalopatia paludica.)** E. F. SANZ, *El Siglo méd.*, 1916, lxiii., p. 514.

A BOY, aged 9 years, in convalescence from a severe attack of malaria, developed paralysis of half of the tongue, soft palate, and vocal cord all on the left side, probably due to a small hæmorrhage in the bulb. The symptoms persisted, and about four years later, during another attack of malaria, he had a series of convulsions, with loss of consciousness, and followed by left hemiplegia. The distribution of the paralysis on this occasion was not uniform, the loss of power being but little marked in the upper limb, somewhat more in the lower limb, and most of all in the corresponding side of the face. This unequal distribution, the decidedly regressive character, and the absence of Babinski's sign, as well as the onset with generalised convulsions, suggested that the condition was due not to a destructive lesion, but merely to compression of the pyramidal system by meningeal, cortical or capsular hæmorrhage.

J. D. ROLLESTON.

STUDIES IN CEREBRAL FAT EMBOLISM, WITH REFERENCE
(489) **TO THE PATHOLOGY OF DELIRIUM AND COMA.** HARRY GAUSS, *Archives of Int. Med.*, 1916, xviii., July, pp. 76-102 (15 figs.).

IN view of the profound disturbance in the central nervous system produced by the secondary changes of fat embolism, it is reasonably safe to conclude that these multiple lesions are intimately associated with the clinical manifestations of delirium and coma.

A. NINIAN BRUCE.

THE SYNCINESIAS OF HEMIPLEGICS. (Les syncinésies des
(490) **hémiplegiques.)** PIERRE MARIE and CH. FOIX, *Rev. Neurol.*, 1916, xxiii., Jan., p. 3.

THE above term is used to denote those involuntary and frequently unconscious movements which occur when voluntary and conscious movements are made. They are of importance practically in the diagnosis of certain slight or associated hemiplegias, and theoretically they are of interest in relation to the physiology of contractures, of voluntary movements, and of medullary automatism. Three main varieties are differentiated—(1) global or spasmodic; (2) imitative; and (3) co-ordinative. The first is defined as a spasmodic contraction of the muscles of the hemiplegic side, the contraction following on an effort. The face is usually not affected. This variety is, in the experience of the authors, the most common.

The imitative form is described as the involuntary, symmetrical movement, reproducing on one side the voluntary movements executed on the other side.

The co-ordinative form consists of involuntary movements following after voluntary synergic movements. Included in this form are the phenomena described by Babinski and Jarkowski as "conjugate movements."

The technique of production of these movements is fully described and illustrated.

In a further article the physiological-pathology will be considered.

D. K. HENDERSON.

A COMPLEX CASE WITH CEREBELLAR AND VESTIBULAR
(491) **SYNDROMES. (The cas complexe de syndromes cérébelleux et vestibulaire.)** A. AUSTREGESILO and O. AYRES, *Rev. Neurol.*, 1916, xxiii., March, p. 348.

AN interesting case, with well-marked cerebellar and vestibular symptoms, due to a bony tumour with enostosis and exostosis over the right parieto-occipital region.

D. K. HENDERSON.

TUMOUR OF THE PONTO-CEREBELLAR ANGLE. (Tumeur de
(492) **l'angle ponto-cérébelleux.)** H. PREISIG, *Rev. méd. de la Suisse Romande.*, 1916, **xxxvi.**, Août., p. 510.

THIS case is of special interest owing to the predominance of early mental symptoms, and consequent difficulty of diagnosis. A woman, 61, showed for four years general feebleness, poor memory, headaches, vertigo, vomitings, and pains in limbs. During a voyage she had an "attack" with loss of consciousness; was then at times suicidally inclined, appeared not to recognise her friends, was unable to take proper care of her money, and was extravagant, though poor. Was admitted to an asylum; there she seemed fairly well oriented, but could not tell the year, nor calculate. There was slow mentality, torpidity, confusion, absence of mind, defective memory as to chief events of her life, and recent changes of abode, and gloominess: writing uncertain, orthography erroneous. Complained of hissing in ears and anorexia: hearing bad on both sides. Slight tremor of fingers, movements slow and clumsy. No dysarthria, but unfamiliar words were pronounced badly. Rombergism: good muscular power: sensibility normal: knee jerks exaggerated. Left pupil larger than right, and inactive to light: reaction in right sluggish. Papillœdema (presumably bilateral). Vision greatly reduced in left eye: cannot read with it. Lumbar puncture showed increased tension, one lymphocyte to the cubic millimetre: Wassermann negative in blood and cerebro-spinal fluid. Lumbar puncture always relieved headaches and gave general subjective relief. Occasional incontinence of urine. After six months left asylum: had become more gloomy, torpid, and aboulic: depression, suicidal ideas, and discontentedness had increased. Death six years after onset of symptoms. Necropsy revealed a tumour on the left side: it was elastic, irregularly rounded, of the size of a nut, and was fused with the nerve centres. It was situated on the middle cerebellar peduncle, had compressed the pons and the trigeminus nerve at its exit, extended behind the left cerebellar hemisphere, and had crushed the flocculus. The seventh and eighth nerves were involved in the tumour. (It is specially mentioned that during life there was absolutely no difference between the two sides of the face: doubtless the absence of symptoms of involvement of the fifth, seventh, and auditory nerves of the left side was due to the extreme mental obnubilation.) The tumour extended in front to the thalamus, but did not damage it. It was easily enucleated. Its topography is figured. The writer refers to somewhat similar cases recorded by Oppenheim, Fumarola, and Jumentié, and he discusses the question of the nature of these tumours, referring at some length to the views of

Verocay and Folke-Henschen. On these points, and the findings of Preisig's microscopical examination, the reader is referred to the paper. LEONARD J. KIDD.

A NEW FAMILIAL INFANTILE FORM OF DIFFUSE BRAIN-
(493) **SCLEROSIS.** KNUD KRABBE, *Brain*, 1916, **xxxix.**, p. 74.

1. The so-called diffuse sclerosis of the brain in children may be divided into at least three quite distinct types: (i.) A syphilitic form; (ii.) Schilder's encephalitis periaxialis diffusa; (iii.) a familial infantile form, of which five cases are discussed in the present paper—the literature probably contains one other case.

2. This form shows the following characteristics: it is usually a familial disease; it sets in somewhat acutely at about the fifth month in a child, who up to then has been quite healthy; it progresses on a chronic course, ending with death five to six months after the onset; universal rigidity of the musculature, violent tonic spasms, probably causing pain, and brought on by touching or noise, form characteristic symptoms. As a rule, nystagmus is present, and in the latter stages atrophy of the optic nerve. Periodic elevations of temperature occur without perceptible cause outside the central nervous system. Finally, extensive paresis and pronounced debility close the scene.

3. The pathological-anatomical findings are: a marked hardness of the white substance of the brain without alteration of its shape. Microscopical examination of three cases showed relative intactness of cortex and the basal ganglia, the nervous centres of the brain and of the spinal cord; destruction of the medullary sheaths and axis cylinders throughout the white substance of the cerebrum (a 2-mm. layer, however, is preserved immediately under the cortex). Complete destruction of the white matter of the cerebellum and degeneration of the spinal nerve tracts are present. The destroyed tissue is replaced by dense fibrillar glia, in which are seen a considerable number of variously shaped glia-cells, mostly protoplasmic; the vessel sheaths are infiltrated with fatty granule-cells and other apparently gliogenous scavenger cells. There is a total want of new formation of vessels or infiltration of the vessel sheaths with plasma-cells, lymphocytes, or leucocytes.

4. The affection must be regarded as a purely degenerative and not as an inflammatory process. The disease presents a certain relationship to Pelizaeus-Merzbacher's disease, aphasia axialis extracorticalis congenita, on one side, and to Tay-Sachs' form of familial amaurotic idiocy on the other side. In other respects, however, it differs conspicuously from both these groups.

A. NINIAN BRUCE.

A CASE OF WILSON'S DISEASE. (Un caso di "Malattia del
(494) **Wilson.")** E. Rossi, *Riv. ital. di Neurop. Psichiat. ed Elettroter.*, 1916, ix., p. 225.

Rossi refers to De Lisi's paper (*v. Review*, 1915, xiii., p. 175), and records a case in a single woman, aged 25, one of twins. The other twin was married, and a mother. The patient's father had died of tuberculosis; the mother was healthy. The other two children had died in infancy of scarlet fever and acute enteritis respectively. The disease began at twenty, with amenorrhœa and disturbance of speech and vision, followed by muscular rigidity and tremors of the limbs. Sensation was not affected. There was marked mental enfeeblement. The patient had not had syphilis or any other infectious disease, and Wassermann's reaction was negative. The issue of the case is not recorded.

Rossi supports the hypothesis of an autotoxic process arising in the organism, but outside the brain, and especially affecting the glands of internal secretion. The toxic process is diffused throughout the organism, and exerts a selective action on the corpus striatum and liver. J. D. Rolleston.

DIETARY DEFICIENCY AS THE ETIOLOGICAL FACTOR IN
(495) **PELLAGRA.** Edward B. Vedder, *Archives of Int. Med.*, 1916, xviii., Aug., pp. 137-172.

There is a certain similarity between pellagra and other known deficiency diseases, namely beri-beri and scurvy. Much of the evidence that has been presented as a proof of the infectious nature of pellagra can be reasonably explained in accordance with a deficiency hypothesis. A deficiency is demonstrable in the diets of most pellagrins. This deficiency appears to be the result of too exclusive use of wheat flour, in association with cornmeal, salt meats, and canned goods, foods that are known to be deficient in vitamins. Changes in the diet of the people of the South have occurred during the past ten or fifteen years. Since we do not know all the changes that have occurred, and cannot judge accurately the importance of the known changes, it is unscientific to assume that the recent increase in pellagra cannot be due to such changes. The hypothesis that pellagra is caused by a deficiency is very plausible, and must be taken into consideration in subsequent studies of this disease. A. Ninian Bruce.

THE SUBSEQUENT HISTORY OF PELLAGRINS IN SPARTAN-
(496) **BURG COUNTY, S.C., WHO SURVIVED THE INITIAL ATTACK.** J. F. SILER, P. E. GARRISON, and W. J. MACNEAL, *Archives Intern. Med.*, 1916, xviii., Sept., pp. 340-375.

THE total number of recorded recurrent attacks of pellagra in this series of patients was 1053, with 130 deaths in the year of recurrence. The death-rate in recurrence was, therefore, 12·3 per cent. The total number of instances of freedom from recurrent attacks of pellagra during a year numbered 617. The ratio of non-recurrence to recurrence was therefore 617 to 1053, or approximately 4 to 7. For pellagrins in the later years of the disease the prognosis is more favourable for recovery from the present attack, but apparently less favourable in respect to escape from recurrence in the next subsequent year. In other words, after successive annual attacks the disease seems to become more firmly established as a chronic disease with annual manifestations, but also becomes less acutely malignant. A year without recurrence is a very favourable omen. Subsequent recurrence is less likely to appear, and if it does appear it is less likely to end in death. Recurrence after several years of freedom from the disease is not uncommon, and a considerable proportion of these recurrences end fatally. It is impossible to say when a patient has definitely recovered from the disease pellagra. It seems very much more advisable to speak of recovery from the particular attack of the disease in a given year. In those patients who escape recurrence for one or more years it is best to consider the disease as arrested or as inactive, much as we do in tuberculosis or in syphilis.

A. NINIAN BRUCE.

ON THE EARLY ONSET OF SEVERE NERVOUS SYMPTOMS IN
(497) **SYPHILIS AFTER TREATMENT BY 606. (De la précocité des accidents nerveux syphilitiques graves après le traitement par le 606.)** GAUCHER, *Ann. des mal. vénér.*, 1916, xi., p. 65.

PROFESSOR GAUCHER believes that in syphilis treated by 606 nervous symptoms are much more frequent, and that severe nervous symptoms develop much earlier, than when the disease is treated by mercury, or even when there is no treatment at all (*cf. Review* 1914, xi., p. 501).

He records two cases of persistent headache during the first two years of syphilis quite distinct from the headache of the early period of infection, and resembling that which marks the onset of neurasthenia or general paralysis.

Both the cases had been treated by salvarsan or neo-salvarsan, and recovered after treatment by mercury and iodide.

Gaucher also relates the case of a doctor treated by 606 who developed general paralysis one year after the onset of infection, and of a cavalry officer, also treated by 606, who developed tabes three years after the onset of syphilis. J. D. ROLLESTON.

THE INTRASPINAL TREATMENT OF SYPHILIS OF THE
(498) **CENTRAL NERVOUS SYSTEM; with the report of cases.** A. ROCKE ROBERTSON, *Brit. Med. Journ.*, 1916, ii., pp. 482-485.

EIGHT cases are recorded at some length. The Wassermann reaction became negative in six, and the clinical symptoms in all greatly improved. The author considers the combined intravenous and intraspinal treatment of syphilis of great value.

A. NINIAN BRUCE.

THE TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS
(499) **SYSTEM WITH INTRAVENOUS SALVARSAN ALONE, WITH INTRAVENOUS SALVARSAN AND INTRASPINAL SALVARSANISED SERUM TOGETHER, AND WITH INTRASPINAL SALVARSANISED SERUM ALONE.** I. C. WALKER and D. A. HALLER, *Archives Intern. Med.*, 1916, xviii., Sept., pp. 376-425.

PATIENTS with recent syphilitic meningitis and cerebro-spinal syphilis may be relieved symptomatically by intravenous salvarsan; the spinal fluid Wassermann reaction may become negative with 1 c.c., and the cell count may become normal. Patients with long-standing cerebro-spinal syphilis and tabes may be benefitted symptomatically following salvarsan, but little or no change occurs in the spinal fluid findings. Patients with recent, and those with late syphilitic meningitis, cerebro-spinal syphilis, tabes, and general paresis of the insane are markedly improved following the combination of intravenous salvarsan and intraspinal salvarsanised serum (Swift-Ellis method), and those who fail to improve under salvarsan alone do improve both in symptoms and in spinal fluid findings following this double treatment.

That intraspinal salvarsanised serum greatly benefits patients with central nervous system syphilis is shown by the fact that those with negative serum reactions and with positive spinal fluid findings are symptomatically relieved by this treatment. In many patients the spinal fluid Wassermann reaction becomes negative with 1 c.c., the cell count becomes normal, and a negative (Noguchi) globulin test is obtained following sufficient treatment with salvarsanised serum intraspinally without other medication.

A. NINIAN BRUCE.

A STUDY OF SERUM SALVARSANIZED *IN VITRO*. HOMER (500) F SWIFT, *Journ. Exp. Med.*, 1916, xxiv., pp. 373-386.

ADDITION of salvarsan to serum *in vitro* produces a spirochæticidal mixture which is increased in potency by heating. The heated serum of salvarsan-treated patients is more spirochæticidal if it has been in contact with the clot over night than if it has been separated immediately after coagulation. This is not true with the serum from blood which has been salvarsanized *in vitro*. The addition of salvarsan directly to serum produces a more potent mixture than results from the serum from blood to which salvarsan has been added in equivalent amounts. The increase in activity of salvarsanized serum produced by heating to 56° C. is due in part to the removal of inhibitory substances in the serum, and in part to a direct increase in spirochæticidal power in the heated serum. Both salvarsanized and neosalvarsanized serum are rendered more spirochæticidal by heating. A more active spirochæticidal mixture is produced by mixing small amounts of salvarsan with the serum of a salvarsan-treated patient than by mixing the same amount with normal serum.

A. NINIAN BRUCE.

A NEW REMEDY FOR SYPHILIS—LUARGOL, OR "102." N. S. (501) BONARD, *Lancet*, 1916, Sept. 23, p. 554.

THE preparation was introduced by Danysz for the treatment of trypanosomiasis. As a substitute for salvarsan it is held that the therapeutic dose is far off the toxic dose. The injections, six or seven in number, are given every second or third day, the total amount varying from 1·20 to 1·50 gm. The therapeutic effects in about one hundred cases treated are stated to have been most satisfactory.

R. DODS BROWN.

LATENT SYPHILIS IN THE ARABS. REACTIONS IN THE BLOOD AND CEREBRO-SPINAL FLUID. (Syphilis latente des Arabes. Réactions du sang et du liquide céphalo-rachidien.) (502) J. A. SICARD and S. LÉVY-VALENSI, *Bull. et mém. Soc. méd. Hôp de Paris*, 1916, xl., p. 1087.

THE benignity of syphilis in the Arabs, and their immunity to nervous complications, tabes, and general paralysis is well known (*v. Review*, 1910, viii., p. 777; 1911, ix., p. 694; 1912, x., p. 296).

The writers, having had occasion to treat a large number of wounded Arabs, took the opportunity of examining their blood and cerebro-spinal fluid by the Bordet-Wassermann reaction, a term which, owing to Bordet's priority, should be substituted for Wassermann's reaction. Thirty Algerians and Moroccans,

aged from 20 to 35, were examined, and a positive result was obtained in about a third, although no clinical evidence of nervous syphilis was found in any.

These findings show that the nervous parenchyma, like that of the other tissues, can be protected by racial immunity from the syphilitic poison, although it is present in the immediate neighbourhood. J. D. ROLLESTON.

A STUDY OF NORMAL AND PATHOLOGIC CEREBRO-SPINAL
(503) **FLUID IN CHILDREN.** MEREDITH R. JOHNSTON, *Amer. Journ. Dis. Child.*, 1916, xii., Aug., p. 112.

As an index of pathological change in the cerebro-spinal fluid, the colloidal gold reaction is more delicate than any other test here employed. A normal fluid causes no reduction of the colloidal gold. A positive reaction is itself sufficient evidence of a pathological process affecting the cerebro-spinal nervous system, even if the fluid is negative to all other tests.

The presence of globulin in the cerebro-spinal fluid, as determined by the tests of Noguchi and Nonne, is indicative of an inflammatory process, but is of no specific import. A negative globulin test may occur in a pathologic fluid.

The quantitative estimation of organic substances by the reduction of tenth normal potassium permanganate shows such wide variations in normal fluids and those with slight pathological change that it has no value as a diagnostic measure.

The qualitative presence of dextrose in the cerebro-spinal fluid as determined by the reduction of Fehling's solution is of little value in the diagnosis of lesions of the central nervous system.

The specific diagnostic import of a given test is dependent on the character of the process causing the change in the fluid examined. Thus the cell content and bacteriological findings are final in purulent and tuberculous meningitis. In the colloidal gold test the characteristic syphilitic zone reaction in hereditary syphilis is sufficient to establish the actual or potential existence of a syphilitic involvement of the central nervous system. This statement presumes a positive Wassermann reaction on the blood.

A number of affections give this same reaction, particularly acute anterior poliomyelitis, and no specific significance can be attached in non-syphilitic cases.

The occurrence of a typical zone reaction in the colloidal gold test on fluids from patients with tuberculous meningitis is probable, and may be of value in diagnosis in the early stages. The occurrence of a transitory reaction in the lower dilutions suggests an aid in the diagnosis of acute anterior poliomyelitis.

A. NINIAN BRUCE.

THE SPINAL FLUID SYNDROMES OF NONNE AND FROIN AND
(504) **THEIR DIAGNOSTIC SIGNIFICANCE.** FRED. M. HANES, *Amer. Journ. Med. Sci.*, 1916, clii., July, p. 66.

COMPRESSION of the spinal cord and its meninges from whatsoever cause leads to the formation of a cul-de-sac, more or less complete, distal to the site of compression. This leads to characteristic changes in the spinal fluid.

The earliest characteristic change has been described by Nonne as an increase of proteid (phase 1 positive) without cell increase (pleocytosis).

As the condition of cord compression persists, the fluid gradually becomes yellow in colour (xanthochromia), the proteid content increases enormously, and the fluid, when removed, coagulates spontaneously (Froin's syndrome). Pleocytosis may or may not be present, depending upon whether or not the meninges are inflamed by the pathological process causing the compression.

Xanthochromia of the spinal fluid must be distinguished from staining of the fluid by hæmaglobin derivatives (erythrochromia).

The spinal-fluid sydrome of Nonne-Froin is very helpful and reliable in the diagnosis of spinal cord lesions. When present it always indicates a compressive lesion of the cord.

A. NINIAN BRUCE.

THE LEUCOCYTE COUNT IN THE CEREBRO-SPINAL FLUID IN
(505) **THE SYNDROME OF CERVICAL RHEUMATISM ASSOCIATED WITH SCIATIC NEURALGIA. (Numération des leucocytes du liquide céphalo-rachidien dans le syndrome de rhumatisme cervical et de névralgies sciatiques associés.)** P. NOBÉCOURT and E. PEYRE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 1127.

THE writers examined twenty cases, with the following results:— In 70 per cent. the leucocytic reaction was slight or nil; in 20 per cent. it was of moderate intensity; and in 10 per cent. it was well marked.

Six illustrative cases are recorded. J. D. ROLLESTON.

THE WASSERMANN REACTION IN ITS RELATION TO TUBER-
(506) **CULOSIS.** C. G. SNOW and A. T. COOPER, *Amer. Journ. Med. Sci.*, 1916, clii., Aug., p. 185.

Two hundred and ninety tuberculous patients were tested. The authors are firmly convinced that tuberculosis need not, in the absence of syphilis, present a positive Wassermann reaction. The reason it does so, under certain circumstances, appears to be

due to the use of cholesterin in the antigens employed, and possibly to other technical errors originating in the desire to simplify the test at the expense of accuracy.

The percentage of non-syphilitic tuberculous patients, whose blood may bind complement with non-cholesterinized antigens, is so small as to be practically negligible. The sera of non-syphilitic tuberculous patients which may give partial ± to complete + + complement-fixation with cholesterinized antigen is about 31 per cent.

A. NINIAN BRUCE.

THE EFFECT OF POTASSIUM IODIDE ON THE LUETIN REAC-
(507) **TION.** JOHN A. KOLMER, TOITSU MATSUNAMI, and STUART BROADWELL, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 718.

WELL marked positive luetin reactions were observed among a group of healthy non-syphilitic persons following the administration of potassium iodide. Similar results were observed following the intracutaneous injection of 0·1 c.c. of 0·5 per cent. agar-agar. The strongest reactions were observed when the luetin was injected during or immediately after the injection of potassium iodide. Positive luetin reactions were observed among normal non-syphilitic persons as late as one month after the injection of large doses of potassium iodide. In some instances the administration of potassium iodide caused the site of a former luetin injection to develop inflammatory phenomena progressive to pustulation. Similar but less marked reactions to luetin and agar were observed among guinea-pigs and rabbits following the oral administration of potassium iodide.

Accordingly a positive luetin skin test has little value in the diagnosis of syphilis among persons who are taking, or have recently taken, potassium iodide. The amount of potassium iodide capable of producing these reactions varies considerably; also the length of time following the injection of iodide when this reaction to luetin may follow. A. NINIAN BRUCE.

CLINICAL STUDIES IN EPILEPSY. L. PIERCE CLARK, *Psychiatric*
(508) *Bulletin of the N.Y. State Hospitals*, 1916, ix., April, p. 131.

THE first part of this study has already been abstracted (*v. Review*, 1916, xiv., p. 126). In this part the epileptic reaction is described as a more or less direct outcome of the epileptic's inability to stand the strain and harassments of life, from which he seeks automatic or unconscious withdrawal. It is shown that even in infancy the actual or potential epileptic shows poor adaptive tendencies even in the first adjustments called for, *e.g.*, in sucking,

chewing, taking their food, in their movements, and also in their lability of mood, tantrums, rages, &c. Such a child makes larger and larger demands on its environment, and when adjustment is not forthcoming a break occurs, and epilepsy developes. One of the cases described is that of a young man, aged 22 years, who has had typical grand mal attacks since his seventeenth year. His personality is studied in detail, and an attempt is made to show how in this case the epileptic reaction was a means of withdrawing the individual from a too-demanding environment. In the treatment of such a case what should be aimed at is the proper adjustment to a normal diversified life under the wise guidance of nurse and physician, who should strive to enter fully into the patient's life from all aspects, and help him to help himself.

Two epileptic families are studied, and a detailed report is given upon the mechanism in one member of the series.

This article is so exceedingly suggestive and important that it should be read in the original.

It is to be continued. D. K. HENDERSON.

A CLINICAL STUDY OF EPILEPTIC DETERIORATION. JOHN T. (509) M'CURDY, *Psychiatric Bulletin of the N. Y. State Hospitals*, 1916, ix., April, p. 189.

THE essential process of deterioration in epilepsy consists in a progressive loss of interest associated with a failure of mentation in respect to normal stimuli in which interest is lost. Apart from the convulsions, the most typical feature of epilepsy is the make-up of the individual, characterised as it is by an overweening egoism.

A breaking-down of the personality, eventually leading to complete loss of individuality, is one of the earliest symptoms, and a contrast is drawn between the distortion of the personality which one sees in dementia præcox, and the blotting out of the personality which occurs in epilepsy. Other symptoms especially mentioned are poor attention, memory defect of the recollective type, a gradual loss of interest, hypochondriacal states in which the patient shows a childish insistence on certain physical comforts or articles of diet, pays undue attention to the alimentary tract, &c. Functional aphasia is present from the beginning of deterioration on, and tends to withdraw the patient still further from contact with the world. In epilepsy striking contrasts are seen; there may be a diffuse intellectual loss, but some restricted capacity will frequently be found which is totally unaffected. The variability of response to tests as described by Healy, the voice sign of Clark, the expression of the patient, the irritability and outbursts of anger, are all emphasised. The similarity of

epileptic deterioration to arterio-sclerotic dementia, and to the end stages seen in cases of mental defect is commented on, and certain symptoms are enumerated which may prove useful in differential diagnosis.

Throughout this paper numerous instructive cases are reported illustrating the occurrence of the various symptoms mentioned, and showing how frequently in epilepsy the various symptoms arise as a reaction to a situation, and how deterioration sets in as soon as the patient begins to lose contact with his friends and his own personal interests. Other cases are reported to show what it is possible to accomplish by working with the patient, by studying his idiosyncrasies, and by attempting to supply healthy interests.

The David Lewis Epileptic Colony in England is favourably commented on, and the importance of an educative as opposed to a custodial system is praised. D. K. HENDERSON.

A REPORT OF SIXTY-FOUR CASES OF EPILEPSY IN PATIENTS
(510) **FROM FOURTEEN YEARS TO FORTY YEARS OF AGE.** L. R. WATERS, *Bull. Johns Hopkins Hosp.*, 1916, xxvii., June pp. 179, 180.

THE following is a summary of this report:—

Age of onset—Under 12 years	-	41
From 12 to 20 years	-	21
Over 20 years	-	2

	Sex.	Age.			Married.	Unmarried.
		14-20	20-30	30-40		
Number of white - 59	Males - 31	13	15	3	6	25
	Females 28	8	12	8	5	23
Number of coloured 5	Males - 3	1	1	1	1	2
	Females 2	2	...	...	...	2

A. NINIAN BRUCE.

A STUDY OF THE ETIOLOGY OF CHOREA. JOHN LOVETT MORSE
(511) and CLEAVELAND FLOYD, *Amer. Journ. Dis. Child.*, 1916, xii., July, p. 61.

SYPHILIS plays no direct part in the etiology of chorea. The cause may be due to a micro-organism or a group of micro-organisms, the source of infection probably being the tonsils or teeth. The belief that there is an intimate relation between chorea, rheumatism, and endocarditis is confirmed. A. NINIAN BRUCE.

THE EFFECT OF SUBCUTANEOUS INJECTIONS OF MAGNESIUM SULPHATE IN CHOREA. HENRY HEIMAN, *Amer. Journ. Dis. Child.*, 1916, xii., Aug., p. 109.

(512)

SUBCUTANEOUS injections of magnesium sulphate, though employed in only five cases, did not produce sufficient improvement to justify further trial. A. NINIAN BRUCE.

SIMULATED SKIN DISEASE IN AN HYSTERICAL PATIENT. (**Dermatosi simulata in un'isterica.**) V. DESOGUS, *Riv. di patol. nerv. e ment.*, 1916, xxi., p. 427.

(513)

DESOGUS refers to the cases of pathomimesis described by Dieulafoy (*v. Review*, 1908, vi., p. 567) and others, and records a case in a woman, aged 27, who had suppurating lesions of the left breast of fifteen months' duration. Rapid recovery took place under simple treatment whenever she was kept under strict observation, but the lesions constantly reappeared.

Finally, she was found by another patient burning her breast with sulphur matches. J. D. ROLLESTON.

RADICULITIS. (**Les radiculites.**) J. DEJERINE, *Rev. Neurol.*, 1916, xxiii., March, p. 321.

(514)

CONSIDERED clinically, radiculitis is essentially a sensory syndrome. The motor troubles frequently associated constitute the sensory-motor syndromes, but, with the exception of the cranial nerves, the author has never seen a pure motor form. The most important of the sensory phenomena are the pains of the neuralgic type, spontaneous, continuous with exacerbations, often very severe, described by the patients as being of a tearing, grinding, and sometimes of a "lightning" character. These pains, however, are not exaggerated by movement or pressure, as they are in neuritis or neuralgia. That which particularly characterises the radiculalgias is the exaggeration of the pain by coughing or sneezing. There is often a history of paræsthesias which the patient can exactly delimit. Objective troubles consist of hypæsthesia, sometimes anæsthesia, and, particularly at the beginning, hyperæsthesia. All these sensory troubles have as their essential character a strictly radicular topography.

The reflexes are most commonly diminished or abolished, and when motor troubles occur they are in the nature of a flaccid paralysis, and may be accompanied by atrophy. Tropic and sympathetic disturbances also occur.

The author differentiates certain varieties of the disorder according to type, symptoms, and localisation.

The principal causes are syphilis and tuberculosis, but it may also occur in association with an acute meningitis.

The prognosis largely depends on the cause; if acute, due to syphilis and treated early, a cure is the rule, but if treated late the condition may persist indefinitely.

The treatment, too, is largely dependent on the cause, but for the pains epidural injections of novocaine frequently give great relief. D. K. HENDERSON.

THE GLUTEAL FOLD IN SCIATIC NEURITIS. HILDRED CARLILL, (515) *Lancet*, 1916, August 19, p. 323.

IN sciatic neuritis the gluteal fold may be very poorly developed: commonly it is absent altogether, whether the affection is unilateral, bilateral, or part of a multiple peripheral neuritis. The ankle-jerks have invariably been absent in those patients in which the gluteal folds had disappeared. Four cases are rather inadequately reported. D. K. HENDERSON.

TREATMENT OF NEURASTHENIA. AUSTEN FOX RIGGS, *Bull.* (516) *Johns Hopkins Hosp.*, 1916, xxvi., Oct., p. 281.

OF 355 cases discharged two years ago or longer, and whose records were complete when they left hospital, the present condition of 129 is known, and is as follows:—

Patients discharged two years and over—129.

No improvement	0·7	per cent.	
Improved	15	„	
Much improved	36	„	83 per cent.
Cured	47	„	83 per cent.

Patients discharged three years and over—91.

No improvement	1	per cent.	
Improved	11	„	
Much improved	30	„	87 per cent.
Cured	57	„	87 per cent.

Improved means any distinct diminution of symptoms, coupled with distinct increase in ability to live normally.

Much improved means ability to live a normal life, and disappearance of at least 50 per cent. of the symptoms.

Cure means full ability to live a normal life without reappearance of symptoms, and if any emergency and difficulties have arisen, ability to meet these in a normal way.

The duration of treatment was four weeks on the average; 40 per cent. were treated for one week or less, and the longest required six months. A. NINIAN BRUCE.

ATROPHY OF THE THYROID GLAND WITH HYPERTROPHY
(517) **OF THE PITUITARY GLAND.** J. GORDON SHARP, *Clin. Journ.*, 1916, xlv., p. 290.

THE patient was a man, aged 46, in whom myxœdema was associated with acromegaly. The thyroid atrophy appeared to be the primary disease, the pituitary hypertrophy being compensatory. A skiagram showed that the bones of the skull were thicker than usual, and that the *sella turcica* was somewhat expanded. Thyroid treatment caused the myxœdema to disappear, thus rendering the bony enlargement more obvious. J. D. ROLLESTON.

POST-MORTEM FINDINGS IN A CASE OF EXOPHTHALMOS OF
(518) **LONG STANDING ORIGINALLY DUE TO GRAVES'S DISEASE.** RONALD MACKINNON, *Brit. Med. Journ.*, 1916, ii., p. 488.

THE patient was a man, aged 35, who developed exophthalmic goitre in 1901 during the Boer War. The symptoms all cleared up except the exophthalmos. No new fact was discovered at the autopsy. A. NINIAN BRUCE.

THE TREATMENT OF PARALYSIS AGITANS WITH PARA-
(519) **THYROID GLAND.** W. N. BERKELEY, *Med. Record*, 1916, xc., p. 105.

BERKELEY has found that from 60 to 70 per cent. of the patients who have given the treatment a fair trial for from three to six months have been greatly benefited. The best preparation is an acetic extract of the fresh glands, which is injected subcutaneously in doses of $\frac{1}{30}$ grain. J. D. ROLLESTON.

ADDISON'S DISEASE: REPORT OF A CASE WITH ACUTE
(520) **ONSET, TERMINATING IN RAPID IMPROVEMENT AND COMPLETE RECOVERY.** THEODORE TIEKEN, *Amer. Journ. Med. Sci.*, 1916, cliii., Sept., p. 422.

THIS case occurred in a butcher, aged 36, and was characterised by the following unusual features:—(1) Sudden onset with pain, chills fever, and sweats; (2) bilateral involvement of the adrenals manifested by marked tumour masses palpable in both lumbar and hypochondriac regions, with positive urinary findings for bilateral renal pelvic involvement; (3) early and rapidly progressive pigmentation of the skin; (4) rapidly developing asthenia, reaching the point of helplessness in seven days; (5) extremely low blood pressure coming on early in the disease; (6) rapidly advancing anæmia, 2,240,000 red cells, and 35 per cent. hæmoglobin in seven

days in a previously healthy, robust young man; (7) rapid improvement following the overcoming of the acute infectious process which was crippling the adrenals; and (8) complete recovery maintained for two years after dismissal from hospital.

A. NINIAN BRUCE.

PSYCHIATRY.

ON THE NECESSITY OF VERY PROLONGED MERCURIAL TREATMENT IN GENERAL PARALYSIS. (De la nécessité du traitement mercuriel très prolongé dans la paralysie générale.)

(521) GAUCHER, *Ann. des mal. vénér.*, 1916, xli., p. 257.

GAUCHER protests against the view that mercurial treatment in general paralysis is useless, and if prolonged, dangerous, by the following propositions:—

1. General paralysis is always a syphilitic affection of the tertiary stage, and not parasyphilitic, but is syphilitic both in origin and nature.

2. Mercurial and iodide treatment, especially the former, is always indicated in every case of general paralysis. It can never do any harm, and may be always of service; it should be started as soon as possible.

3. The treatment is often very long in producing any effect, and should therefore be persisted in for years.

4. Even when the treatment has produced its effect, and the disease appears improved, if not cured, mercurial treatment should be continued *indefinitely*, at intervals, to prevent relapses.

Gaucher records two illustrative cases, in one of which the patient had been seen by Brissaud, Raymond, and Joffroy, who had all agreed in the diagnosis of general paralysis, and in the prognosis of incurability and an early death. These three neurologists had all died, while the patient whom they had all condemned was still alive and in good health, and had been following a mercurial treatment for the last ten years.

J. D. ROLLESTON.

THE NATURE OF THE DEMENTIA IN DEMENTIA PARALYTICA.

(522) C. MACFIE CAMPBELL, *Psychiatric Bulletin*, 1916, ix., July, p. 316.

DEMENTIAL symptoms may occur at an early stage of the disease as transitory manifestations. The decision as to whether the dementia is definitive or not depends not on the presence of any single pathognomonic symptoms, but largely on the severity of the various symptoms. The most fundamental symptoms in the dementia are the deterioration of the personality and the memory

defect. The change in the personality shows in a loss of responsiveness to ethical, æsthetic, intellectual, and conventional standards. The patient becomes irritable, impulsive, is apt to engage in alcoholic and sexual debauches, and violent outbursts of temper.

The absurd delusional ideas are a result of the disintegration of self, and not merely a perverted attempt at the extreme realisation of self. D. K. HENDERSON.

CHEMICAL STUDIES ON THE CENTRAL NERVOUS SYSTEM.
(523) BURT E. NELSON, *Psychiatric Bulletin*, 1916, ix., July, p. 368.

IN the first part of this paper the results are given of an analysis of the organic portions of brains from cases of general paralysis, dementia præcox, and presenile psychoses.

In the second part the results of a substance known as brain protogon are given. D. K. HENDERSON.

SOME FACTORS IN SCHIZOPHRENIC DEMENTIA. CLARENCE B.
(524) FARRAR, *Psychiatric Bulletin*, 1916, ix., July, p. 323.

FARRAR enumerates and describes what he calls certain well-developed anlage types of dementia præcox, the (1) backward, (2) precocious, (3) neuritic, (4) asocial, and (5) juvenile.

He draws attention to the fact that in schizophrenic dementia there is not an impairment of all the mental functions, but that it is essentially an emotional-volitional disorder. The subject is not dealt with symptomatically, but from the point of view of differential pathogenesis. The mental deterioration is held to be the result, and a part of a specific imperfect type of psycho-biological evolution. The essential element in this is held to be an incomplete development of personality-sense along with an associated feeling of inadequacy. D. K. HENDERSON.

ALCOHOLIC HALLUCINOSIS, WITH SPECIAL REFERENCE TO
(525) **PROGNOSIS AND RELATION TO OTHER PSYCHOSES.**
GEORGE H. KIRBY, *Psychiatric Bulletin*, 1916, ix., July, p. 353.

THE essential features of an alcoholic hallucinosis are: an acute beginning of an auditory hallucinosis, accompanied by a well-marked affect of fear, and an unclouded sensorium. The absence of toxic-organic symptoms, the preceding emotional factor which seems to act with the spree as the precipitating cause, the utilisation of this emotional factor in the content of the psychosis which also includes, with striking uniformity, adult sexual situations, all serve to show that, looked at in this way, the alcoholic hallucinoses

might be looked upon as constitutional reaction types, or psychogenic disorders, rather than specific reactions to alcoholic poisoning.

The prognosis is good, but there is a tendency to recurrence, some cases become chronic, and occasionally show a transformation, and pass into an incurable state not to be differentiated from dementia præcox.

Kirby has studied 102 cases, of whom 72—or practically 70 per cent.—were discharged as recovered. 22 cases are still in hospital; of these, 14 are cases of dementia præcox; 1 is a chronic hallucinosis; 3 others are chronic hallucinoses with the later development of a phantastic trend; 2 are chronic alcoholics who showed episodes rather of a delirious or epileptoid character and are now deteriorated; 1 is a mania with hallucinatory features in two previous attacks, and 1 has turned out to be a general paralytic.

In the 14 cases now diagnosed as dementia præcox it was found on a closer analysis of their case histories that all of them, except 2, had shown dementia præcox symptoms previous to the development of their hallucinosis.

In 2 of the cases a transition has really seemed to occur from a simple hallucinosis to dementia præcox.

7 per cent. of the 102 cases have shown manic-depressive features. D. K. HENDERSON.

CHRONIC HALLUCINOSIS. (La psychose hallucinatoire chronique.)
(526) GILBERT BALLET, *Rev. Neurol.*, 1916, xxiii., Jan., p. 41.

THE symptomatology, psycho-pathology, and etiology of chronic hallucinosis is considered. A general review is given of the conceptions of other authors. An attempt is made to show that the symptoms are essentially due to a disintegration of the personality, and are not associated with intellectual enfeeblement. The condition is summed up as a chronic, incurable dissociation.

D. K. HENDERSON.

THE DEMENTIA OF CEREBRAL ARTERIO-SCLEROSIS. AUGUST
(527) HOCH, *Psychiatric Bulletin*, 1916, ix., July, p. 306.

THE principal characteristics are a progressive memory and retention defect, and an absence of deterioration of the personality. The memory defect is patchy, varies from time to time, and the memories are less readily at the command of the patient. "It seems more correct to lay stress upon the process of thinking rather than on the memory." Some of the other symptoms which one commonly sees are perseveration, and various aphasic, agnosic, and ideatory-apraxic phenomena.

In regard to the preservation of the personality, the striking thing is how well these patients realise their mistakes and difficulties, and really behave like patients in a general hospital.

Another feature which is emphasised is the relative rarity of actual psychotic manifestations. D. K. HENDERSON.

PSEUDOLOGICA PHANTASTICA, OR PATHOLOGICAL LYING, (528) **IN A CASE OF HYSTERIA WITH MORAL DEFECT.** WILLIAMINA SHAW DUNN, *Journ. Ment. Sci.*, July 1916, p. 595.

THE personal history and the physical and mental symptoms accompanying the above affection in a youth are fully described.

H. DE M. ALEXANDER.

ZOLA'S STUDY OF HEREDITY. J. BARFIELD ADAMS, *Journ. Ment.* (529) *Sci.*, 1916, July, p. 530.

THE author, in this instructive paper, has compiled in tabular form the genealogical tree of the family whose life histories are depicted by Zola in his Rougon-Marquart series of novels. The object of Zola is to show the result of the fusion of a neurotic and degenerate race with, first, a stolid and healthy one, and second, with another which, though comparatively healthy, has become vitiated by alcoholic and other excesses. The various branches springing from such stock are grafted on others more or less healthy, and are subjected to the stress of circumstance and environment, and the results noted.

The novels illustrate the predominant potency of the maternal influence in transmitting mental disease to the offspring (Dr Adams is of the opinion that the mother is more likely to transmit the taint to the child that she nurses than to the one she does not nurse, even when the disease has not revealed itself in her, the mother's, generation); the evil effects of alcohol—for alcoholism in the parent, even when it is not handed down as such, seems to facilitate the transmission to the offspring of taints which otherwise would have lain dormant or have been suppressed altogether; the influence of environment in the development of character; and the effect of stress on an unstable mind.

But Zola was not a pessimist. His books would be but sorry reading if it were not for the hope of the ultimate regeneration of the race which vibrates through every story; and thus from amongst his crowd of degenerate characters the novelist shows us gentle scientists like Dr Pascal Rougon, unselfish, level-headed women like Pauline Quenu, and honest citizens like Jean Macquart.

H. DE M. ALEXANDER.

CASES OF HIGH GRADE MENTAL DEFICIENCY. JANE I. (530) ROBERTSON, *Journ. Ment. Sci.*, 1916, July, p. 485.

THE author describes a case in detail. These individuals still remain round pegs in the square holes, whether of prison or asylum. A third type of legal segregation would therefore seem imperative, which should come into operation before ever the tedious and expensive medico-legal conflict over the patient arises. They are of every social grade. They are a social menace and exercise an evil influence over their companions, an influence that is rarely fully appreciated by parents or guardians. Cure is impossible. The history of every one of these high grade imbeciles shows that the simple, the gentle, and the stupid are their victims in purse, reputation, and peace of mind; yet these form a large section of our eminently respectable and industrious, and, therefore, valuable citizens. Society has a right to be protected from them. As these cases are capable of good work under discreet guidance, it should not be impossible to make them defray much of the cost of their own keep. Environment during childhood has no influence on them. The mental defect in these cases only becomes apparent during the years of late childhood or early adolescence. Teachers can convey to these children a very considerable amount of instruction, but they cannot be educated. They are defectives, but they cannot, owing to their comparatively high grade development, be classified under the Binet-Simon tests. The parents are not good or suitable observers of the condition, and the awakening comes too late. The school-teachers, of whatever social class, should be educated in the elements of normal mental development, and be capable of recognising the various indications of mental deficiency in their pupils occurring at any age. These indications are—precocity of any kind; voracious reading; an unusual facility and flow of language, uncorrelated with any attempts at original literary composition; the discrepancy between a child's intelligent, alert manner, and apparently quick apprehension, and its power of reproducing good work of its own initiative; the permanence of an emotional and moral indifference; the permanence and expansion of a habit of ingenious and plausible lying; and a reputation among their companions of being "queer."

H. DE M. ALEXANDER.

OCCASIONAL NOTES ON THE MENTAL DEFICIENCY ACT. (531) SIR BRYAN DONKIN, *Journ. Ment. Sci.*, 1916, July, p. 469.

THE author deals with some prevalent misconceptions regarding the above Act, and in summing up on the general question of testing a person's mental capacity in order to determine whether

he is or is not "feeble-minded" within the meaning of the Act, remarks that "no mere sitting examinations can be expected to suffice." "The only way to determine whether the examinee can do a thing is to observe whether in fact he does it." The description of feeble-minded persons in the Act "points to defect in the way he manages his life in all its circumstances and aspects, and this cannot be investigated by any verbal examination. It can be tested only by observing him in the circumstances of his life, and determining how he behaves in regard to them, how he deals with them, and how far he succeeds or fails."

Disorder of conduct is the essential factor in the diagnosis of all kinds of what is called mental defect, and more especially in those cases where the defect of intellect, though existent, is not readily demonstrable; conduct is also the test in deciding the degree of responsibility of a criminal, who, though he knew that the act he did was wrong, might yet be unable to appreciate all the circumstances and consequences of his act, and thus to misconceive and underestimate its wrongness.

H. DE M. ALEXANDER.

EXTRACTS FROM AN ADDRESS DELIVERED 12th APRIL 1916, BEFORE THE ZOOLOGICAL DEPARTMENT OF THE UNIVERSITY OF CHICAGO. CASPER L. REDFIELD, *Journ. Ment. Sci.*, 1916, July, p. 573.
(532)

PRESIDENTIAL ADDRESS, "OUR WORK AS PSYCHIATRISTS, AND ITS OPPORTUNITIES." EDWARD M. BRUSH, *Journ. Ment. Sci.*, 1916, July, p. 578.
(533)

THE first of these papers deals with some aspects of heredity; and the subject matter of the second is explained by its title. Neither paper lends itself to abstraction, and should be read in its entirety.

H. DE M. ALEXANDER.

THE SCOPE OF PSYCHOPATHOLOGY. ADOLF MEYER, *Psychiatric Bulletin*, 1916, ix., July, p. 297.
(534)

A GENERAL address defining the aims of the Psychopathological Society, and urging a more individual method of studying our cases.

D. K. HENDERSON.

Reviews

THE INSTITUTIONAL CARE OF THE INSANE IN THE UNITED
(535) **STATES AND CANADA.** HENRY M. HURD, WILLIAM F. DREWRY, RICHARD DEWEY, CHARLES W. PILGRIM, G. ALDER BLUMER, and T. J. W. BURGESS. Edited by Henry M. Hurd, M.D., LL.D., Emeritus Professor of Psychiatry, the Johns Hopkins University. Vol. I. Pp. xii.+497, with 30 illustrations. The Johns Hopkins Press, Baltimore, M.D. 1916.

To anyone interested in the history of insanity this volume should prove of unique interest. It was originally undertaken with the object of supplying, in detail, histories of every institution in the United States and Canada, with special reference to their foundation and development. As the work progressed, however, it was found that such a compilation would not present in a concise and accessible form many important facts which were considered worthy of record for future use, and certain general chapters were therefore added. The result is the present volume, which is the first of the series. The American Medico-Psychological Association, who authorised the above committee to assume charge of this project, are indeed to be congratulated upon the publication of such a magnificent piece of work. Some idea of the size of the work involved will be understood when it is realised that the superintendents of about two hundred institutions in the United States and Canada have helped in the making of the book, and thus allowed the preparation of an adequate history of the movement in the various states and provinces to be recorded. A gradual evolution in the care of the insane in America during the past half century can be traced, which gives most encouraging results in regard to the increasing hopefulness of cure, while the movement towards the prompt treatment of curable cases, without the formality of legal commitment and under the same conditions as in admission to a hospital for general bodily disease, gives every hope that cases of recent attack may be promptly taken in hand and greatly increased numbers cured.

In a book like this, which contains so much valuable and interesting information, it is difficult to single out any particular chapter for special praise, but we feel that no one can but be specially attracted to chapter three, which gives an account of Miss Dorothea Lynde Dix and her work. This remarkable lady stands out as one of the most conspicuous pioneers in the history

of insanity, especially from the standpoint of personal labours to promote practical reforms in public provision for the insane. She was born on 2nd April 1802 at Hampton, Me. Her surroundings in childhood were humble, and she had a hard struggle to obtain an education, followed by a toilsome period spent in school teaching. But in spite of these difficulties in her early life and of the semi-invalidism which, later on, hampered her physical activity, there are now standing thirty-two institutions for the insane which were either founded outright, or greatly enlarged, as the result of her wise and practical efforts. After the unexpected disappointment of her plans to persuade Congress to place the problem upon a national basis, she came over to England, and shortly after her arrival paid a visit to Scotland. With the aid of Lord Shaftesbury she succeeded in getting the authorities to establish a Commission, as a result of which the Scottish Lunacy Act of 1857 was passed and a Board of Lunacy established. She also visited many European countries, instituting many reforms.

Besides this fascinating piece of biography, a most interesting account is given of the Association of Medical Superintendents of American Institutions for the Insane, which was formed in 1844 and existed till 1893, when the American Medico-Psychological Association came into being. We also find that the *American Journal of Insanity* was originally started at private expense in 1844, and soon became the organ of the whole specialty of insanity in America. It was much later that the Council of the Association, after negotiation, purchased the *Journal* and adopted it as their official publication.

A vast amount of important information about the early and colonial care of the insane, state care, private care, administration of hospitals, research work, psychopathic treatment, laws of commitment and detention, &c., are all recorded here.

Numerous illustrations of distinguished alienists and of old asylums greatly add to the interest of the book. We miss a portrait of Miss Dorothea Dix, however, but possibly this will appear in a later volume, which we are sure will be looked forward to by all who are interested in the history of psychiatry.

THE MEANING OF DREAMS. Isador H. Coriat, M.D. Pp. (536) xiv.+194. Mind and Health Series. Wm. Heinemann, London. 1915. Pr. 5s. net.

The literature about dreams is increasing rapidly, and many different views are being held about their significance and interpretation.

The present volume surveys the principles and results of

scientific dream analysis along the lines first formulated by Freud. There is no doubt that the fundamental principle upon which all dream analysis rests is sound, namely, that every dream, no matter how trivial, fantastic, or meaningless it may seem, has a definite meaning, and a meaning that sometimes is of great significance to the dreamer. Dr Coriat himself is an enthusiast on his subject, as he states that "for abnormal psychology, dream analysis can be compared only in importance with the discovery of the origin of species, and of the factors of organic evolution in the field of biology," and "that it has its practical side in giving medicine the most potent instrument which it has ever possessed in the treatment of certain functional nervous disturbances."

The whole subject of dreams is touched upon here. The subject is regarded purely along psycho-analytic lines, and every dream is personally analysed by the author. The volume is simply written, and forms a good introduction to Freud's works.

THE DREAM PROBLEM. Dr A. E. MAEDER (of Zurich). Authorised
(537) translation by Drs Frank Mead Hallock and Smith Ely Jelliffe. Pp. 43. Nervous and Mental Disease Monograph Series, No. 22. New York. 1916. Pr. $0.60.

DR MAEDER sets forth in this short monograph what he believes to be a distinct advance in the concept of the meaning of the dream and in the method of its interpretation. While he agrees with Freud in many ways, he is really associated with what has now come to be known as the Zurich School of Psychoanalysis, and which, headed by Jung, sees in the dream much more than a retrogressive wish-fulfilling structure couched in sexual symbols. Dr Maeder believes that the work of the dream is preparatory in function and that it, as it were, gathers together and arranges the materials of the conflict preparatory to reaching a solution thereof, and that, correctly interpreted, the dream not only has a retrospective significance, the roots of which may be found in the sexual, but that it has a decidedly prospective significance; in other words, that it clearly indicates the direction in which the patient must go in order to get well.

The author attaches much greater importance to the manifest content of the dream than does Freud. The so-called objective level, or clinical setting, according to him, also has a great significance as indicating the nature of the life task of the patient.

The translation is well done, and the monograph is well worth perusal.

COLLECTED PAPERS ON ANALYTICAL PSYCHOLOGY. By Dr
(538) C. J. JUNG. Authorised Translation edited by Dr Constance Long. ' Pp. 392. Baillière, Tindall & Cox. London, 1916. Pr. 12s. 6d. net.

THIS is a collection of essays written by Jung during the past fourteen years. In a science that progresses so rapidly as medical psychology has done of late years, this is a long enough period to prepare one for considerable changes in the point of view of any writer who has played a prominent part in this field. But there is assuredly no work on the subject that exhibits such startling and mutually contradictory changes as are to be found in this one. The first essay on so-called occult phenomena, written in 1902, antedates the period of Jung's adherence to the psycho-analytical school; the next five and the thirteenth were written while Jung was working in conjunction with the other members of this school; the fourteenth chapter dates from a transitional period; while the remaining six belong to his latest period, subsequent to his severance from psycho-analytic work. As is perhaps well known, Jung, after for several years seeming to accept the main points of view and conclusions of psycho-analysis, gradually renounced them, and reverted to the pre-Freudian and still popular views concerning the neuroses: those, namely, according to which the responsibility for the condition is divided between congenital factors and the moral weakness of lazily shirking current difficulties imposed by the life of actuality, in which no essential part is played by conflicts and erroneous development relating to sexuality, and where the infantile psychogenesis is of no account. Jung has, it is true, added a flavour of his own, by presenting the matter in philosophical terms of a more than doubtful quality, in which he operates with teleological causes of an order not admitted elsewhere in science; in fact he freely admits that he has to transcend the too narrow bounds of scientific procedure and thought in order to formulate conceptions that will satisfy him. That being so, it becomes unnecessary here to consider these conceptions, which also have been adequately criticised elsewhere. It is only unfortunate that Jung tries throughout to slur over the extent to which his views have radically changed in the last few years, and even likes still to call himself a psycho-analyst.

The translation of the papers has been very well done indeed, and it is a relief to find some of this literature translated into English instead of into American. It is nowhere stated who is responsible for the translation, but from some correspondence in the weekly medical press one gathers that by far the greater part was done by Dr and Mrs Eder, who are therefore entitled to the

credit of very successful work. Owing to carelessness in editing (with four of the essays the date of publication is omitted) an unfortunate mistake in chronology has been made. The thirteenth chapter, published in 1909, should come next to the first; while the fourteenth, published in 1911, should come next to the fourth. The editor has perhaps been misled by following the dates of reprints of these two papers, but the mistake is a confusing one for an uninformed reader who may be trying to trace the evolution of the author's thought. ERNEST JONES.

THE SEX COMPLEX. A study of the relationships of the internal secretions to the female characteristics and functions in health and disease. W. BLAIR BELL, B.S., M.D. Pp. xvii.+233, with 50 figs. Baillière, Tindall & Cox, London. 1916. Pr. 12s. 6d. net.

(539)

THE title of this work is somewhat misleading, as it does not suggest what the author is actually investigating. A more exact idea would be conveyed by some such term as "the sex endocrine complex." It is usually thought that the ovaries are the agents of femininity. The author, however, considers that this is not correct, and that the reproductive functions are directed and controlled by all the organs of internal secretion acting in conjunction. The ovaries are thus to be regarded merely as part of a definite *genital system*, in which probably all the internal secretions play a part, and are of equal reproductive importance with the ovaries themselves. It is also considered that the genital influence of the ductless or endocrine glands acts not only upon the uterus, but also on the general metabolism, and hence on the psychology of the individual. A similar conception also holds for masculinity, although this is only briefly touched upon here.

The book is divided into two parts. The first part deals with the experimental results of removal of the different endocrine organs, and the effects on those left behind. The effects upon the genital system of removal of the ovaries, the thyroid, the parathyroids, the pineal, the pituitary, the thymus, and the suprarenals are discussed in turn. The ovaries have to ensure the reproduction of the species by furnishing ova, but they do not influence metabolism directly, their influence being merely concerned in keeping the other members of the endocritic system in touch with the necessities of the reproductive situation. The rest of the endocritic system is related to the genital functions in various ways, the thyroid, pituitary, and suprarenals influence the development and subsequently preserve the integrity and activity of the genitalia, while the thymus, and possibly the pineal, appear to prevent sexual precocity. Further, all the endocritic organs acting in harmony control the metabolism in response to the

necessities of the genital functions, adapt the whole organism to the situation, and regulate the secondary characteristics, both physical and psychical, to suit the needs of the individual. Once the reproductive organs are removed or atrophy, the genital functions of the rest of the endocritic system cease, and the rearrangement of the metabolism that follows produces the symptoms of the menopause.

Part II. deals with pathological considerations, including derangements in the development of the genital organs and functions, and derangements of the fully established female characteristics and functions. This leads to the subject of hermaphroditism. That a true hermaphrodite, as evidenced by an ovo-testis, exists has yet to be proved. The author's view is that only three cases, including his own, satisfy the necessary conditions. He describes a case of "partial glandular hermaphrodism" in an apparent woman, aged 17 years, with some inversion in hair and larynx. The genital tract was that of a female, and both ovaries contained ova upon microscopical examination. The left ovary, however, also contained adenomatous tissue, but no sperm cells. This appears to have been Müllerian epithelium, which is occasionally found in the ovary of the human female. The second case is an ordinary male pseudo-hermaphrodite. Curiously, although the author believes in the internal secreting glands as the cause of femininity, he does not apply his theory in these two cases, the diagnosis of the first case being based on the ovary. This part concludes with a chapter upon sexual and reproductive psychoses and neuroses. He blames the alienist for having failed securely to grasp the fact that "insanity may actually depend on the state of the internal secretions." He considers that excessive and diminished sexual feeling, and the various resulting pyschoses, are due to excess or diminution of "ovarian secretion," although it is well known that double oöphorectomy in many cases leaves the sexual feelings unaffected, or even increased. And according to the view put forward in the earlier part of the book, that the ovaries merely act through their general influence on the genital system, this is exactly what might be expected to occur.

The psychological and psychiatric chapters are the weakest part of the book, and the argument in the second part is not in keeping with that advanced in the first part. The earlier portion, however, detailing the experimental work, together with the author's views on the interrelation of the endocrine glands and their influence upon masculinity and femininity, is the valuable part of the book, and it is to be hoped that the author may be able to develop this at greater length and with more consistency in a future edition.

ESSENTIALS OF MEDICAL ELECTRICITY. E. REGINALD MORTON, M.D., F.R.C.S. Third edition, revised and rewritten, with addition of new matter by ELKIN P. CUMBERBATCH, M.A., M.B., B.Ch. Pp. xiv.+303, with 11 plates and 72 illustrations. Henry Kimpton, London and Glasgow. 1916. Price 6s. net.
(540)

ELECTRICITY, apart from its use in testing the reaction of muscle and nerve, is used in three classes of cases. First, those in which it procures relief or cure where other methods have failed, or are slower and less efficacious; second, those in which the symptoms may be relieved by electrical treatment; and third, those cases which drift down, like derelicts, to the electrical departments of hospitals on the chance that some benefit may be derived there.

The number of conditions in which electricity may be advantageously used is very rapidly increasing, especially since the value of high-frequency currents and ionisation has become recognised and established. It thus becomes essential that those who make use of electricity in treatment should understand the types of cases which are suitable for such treatment, and likely to receive benefit from it. The general principles which require to be understood are described here. The physiological and therapeutic effects of electricity are regarded as the result of either chemical or physical changes which are produced in the tissues. These are here described, as well as the different methods of applying electricity, electric baths, surgical ionisation for the destruction of tissue, ionisation in deep-lying tissues, electric baths, electrical treatment of paralysis, high-frequency current, diathermy, static electricity, and the electrical testing of muscle and nerve. It is pointed out that the term "cataphoresis" should be distinguished from "ionic medication," and should be reserved for merely the gradual passage of water from the region of the anode to the region of the kathode. It plays no essential part in the process of ionic medication. An alphabetical index is given of the various conditions for which electrical treatment may be applied, and the best method of doing so. The last chapter discusses physical principles, which, however, are only very superficially described. There is an index and many illustrations of electrical apparatus and instruments.

SERUMS, VACCINES, AND TOXINS in treatment and diagnosis. WM. CECIL BOSANQUET, M.A., M.D., F.R.C.P., and JOHN W. H. EYRE, M.D., M.S., F.R.S.Ed. Third Edition. Pp. viii.+456. Illustrated. Cassell & Co. Ltd., London, New York, Toronto, and Melbourne. 1916. Pr. 9s. net.
(541)

THIS book, which has now reached its third edition, has already gained for itself an established position. It is here revised and

thoroughly brought up to date, nearly one hundred extra pages of new matter being added. The whole subject of serums and vaccines is carefully worked through, the essential points in each case being simply and clearly explained, while the addition at the foot of each page of references to the literature adds considerably to the usefulness of the book as a work of reference.

Special attention is directed to the extended use of the complement-fixation reaction, not only in the form of the well-established Wassermann test for syphilis, but also in the diagnosis of other infections and the correlation of certain physical phenomena with these reactions. The Wassermann reaction is considered to become positive as soon as spirochætes can be demonstrated in serum from the primary lesion. The question of vaccine treatment is considered at length. The dosage of ordinary bacterial vaccines is only briefly referred to, owing to the fact that the standardisation of vaccines is still in its infancy, and that it is almost impossible to compare the effective doses of vaccines bearing the name of the same micro-organism, but emanating from different laboratories. The so-called phylacogen treatment "is not only useless, but under certain circumstances may be dangerous," especially as most of the organisms employed are ordinarily incapable of producing any appreciable amount of exotoxin in broth-cultivation, and there results only a solution of altered protein more or less toxic in itself. The recent advances in the scientific employment of chemotherapy in therapeutics receives due attention.

We have no hesitation in recommending this latest edition as an excellent text-book for anyone wishing to understand this increasingly important branch of therapeutics.

S. WEIR MITCHELL, M.D., L.L.D., F.R.S., 1829-1914. Memorial (542) Addresses and Resolutions. Philadelphia, 1916.

THIS beautiful volume of memorial addresses has been published by the College of Physicians of Philadelphia as a tribute to the memory of Dr S. Weir Mitchell, who died on January 6th, 1914, shortly before his eighty-fifth birthday. It contains many memorial notices, written with a degree of sympathy and understanding which would be difficult to surpass, and which must be warmly welcome to all who came into contact with Dr Weir Mitchell in any of his forms of activity, as well as to those who only knew him by reputation. Almost all are written by friends who were intimately associated with him in his life's work, and form a fine appreciation of his worth. The book is beautifully reproduced, and contains an excellent portrait.

Review
of
Neurology and Psychiatry

Original Articles

THE FINER HISTOLOGICAL CHANGES IN THE TRAUMATIC DEGENERATIONS OF THE SPINAL CORD, FOLLOWING BULLET WOUNDS OF THE CORD SUBSTANCE, OR SHOCK TO THE VERTEBRAL COLUMN.

By AUBREY MUSSEN, M.D. (McGill).
Assistant in Psychiatry, Johns Hopkins Hospital; Neuropathologist, Medical Research Committee, London. May 1915-16.

(With Plates 7 and 8.)

BEFORE considering the degenerations found in these conditions, it may be advisable to briefly review the relations between the spinal cord and the vertebral column. For a severe shock to the column, without directly involving the cord, may produce profound disturbances in the spinal medulla. And when the cord itself is directly affected, these same relations bear an important part in transmitting to distant regions the effects of the concussion.

The spinal cord lies loosely within the vertebral canal. It is surrounded by fluid and protected by membranes. The outer of these membranes, the theca, forms a wide dense fibrous sheath which is separated from the wall of the canal by a narrow interval containing fatty tissue. The pia mater, a thin fibrous membrane, closely invests the cord. The space between these is filled with fluid in which the cord is supported by the ligamenta denticulata.

These broad and firm bands arise from the pia on the lateral surfaces of the spinal medulla, and are attached to the dura. From the deep surface of the pia numerous septa penetrate into the cord substance. The most important of these are the posterior median septum which connects with the posterior commissure, and the lateral septa which, after passing through the white substance, end by uniting with the neuroglial fibres of the lateral horns. These septa, which assist in attaching the pia firmly to the cord, are closely connected with the supporting glia structure of the white and grey matter. And this structure forms a sheath to the myelin and is intimately associated with the axis cylinders. We thus see that any severe shock to the spinal column could be transmitted through these membranes directly into the substance of the cord.

Having recalled these facts, we will appreciate more clearly why a heavy blow to the spinal column, as when a bullet embeds itself in the body of a vertebra without injuring the cord, can produce such profound disturbances, and why also the fracture of a spinous or transverse process will sometimes cause such serious results.

The cases available for this research comprise—bullet injuries of the brain, with secondary effects on the spinal cord; bullet wounds involving the cord directly; fracture of the laminæ with injury to the cord substance; wounds involving the transverse process of a vertebra; and bullets embedded in the body of a vertebra without direct injury to the spinal medulla—a sufficient variety of cases from which to form some definite conclusions.

As the duration of the illnesses varied, the material investigated represented degenerations of 10 hours, 24 hours, 48 hours, 60 hours, 1 week, 11 days, 7 weeks, 2 months, 4 months.

The methods employed were as follows :—

(*a*) Bielschowsky's silver impregnation method, to determine the changes in the axis cylinders.

(*b*) Mallory's frozen section method, to show the alterations in the myelin sheaths (yellow); axis cylinders (blue); neuroglia cells (blue); neuroglia fibres (violet).

(*c*) Marchi method, for the degeneration of the myelin.

(*d*) Herxheimer's Scharlach R. method, to examine for the earliest traces of fat degeneration, and to study their relations to the nerve fibres, glia cells, and blood vessels.

(*e*) Marchi counterstained by Mallory, to facilitate the investigations of the changes in the later stages of the degenerative process, for the tissue unstained by the osmic acid is beautifully differentiated by the Mallory.

Case I. (10 *hours*).—*Captain A. Stokes, No. I. Lab. B.E.F.*

The soldier was wounded by a hand grenade. One piece entered the right frontal lobe of the brain; there was no great hæmorrhage, though sufficient to fill the region of the pons with clot. A second piece entered the neck, divided the right vagus, opened the jugular, and went on and bared the transverse process of the fifth or sixth cervical vertebra. It did not penetrate into the canal. He lived about ten hours. The post mortem showed that the cord was apparently uninjured.

Bielschowsky preparations from the cervical region show that the axis cylinders throughout the greater portion of the longitudinal section are normal. Their course across the whole field is straight; the fibres, which are of an equal size throughout, show a slight waviness, but there are no sharp twists. In another region of the same section the axis cylinders are suddenly bent at regular intervals, but there is no swelling or breaking of the fibre.

Mallory sections show the twisting of the axis cylinder as well as a distinct globular swelling of the myelin sheath, which also presents in some fibres a granulated appearance. Some fibres show a distinct swelling of the axis cylinders at regular intervals. This is generally associated with fibrillation, and occasionally with partial rupture; no changes were observed in the neuroglia cells.

The Marchi method shows here and there, extended along some nerve fibre, a few small dark staining balls of myelin. From their small size and the fact that the Scharlach R. shows no fat reaction it is evident that they are the Elzholz bodies, symbolic of the normal metabolism of the central nervous system.

Case II. (24 *hours*).—*Captain Stokes.*

This was only a portion of a cord. It showed a complete transverse division about the level of the first dorsal segment from a rifle bullet. Death occurred twenty-four hours after the injury. Sections stained by the Bielschowsky method show that the fibres are swollen, and in many instances broken. Many fibres are thrown into kinks and twists, which are sometimes so marked that complete loops are formed. The large majority of the fibres, though, in this section are normal.

Mallory.—A transverse section near to the lesion shows that in both lateral regions considerable disturbance has taken place with destruction of tissue. This is more marked on one side than on the other. On the least affected side one sees that a lateral septum, where it comes into relation with a vessel some distance from the surface, is torn, and the surrounding tissue shows a small hæmorrhagic infiltration. There is some swelling of the nerve fibres with vacuolation. On the opposite side the disturbance involves a much larger area. Several of the septa are torn, and in each case there is an infiltration of blood cells with disturbance of the surrounding nervous tissue. An illustration of the peculiar distribution of the shock effects is well shown here. One of the main lateral septa has evidently felt the force of the disturbance particularly, for along its course, where it comes in contact with a small vessel, the tissue is lacerated, a small hæmorrhage resulting. During its further course through the fibres of the white matter the tissue is quite normal, but when the septum reaches the grey matter of the lateral horn the structure is again torn, and three small hæmorrhages are observed. Around one of the branches from this septum a small localised area is affected. Two nerve fibres are involved.

The surrounding tissue is torn and infiltrated. The nerve fibres are swollen, particularly one of them, to about six times the size of those in the neighbourhood. The swelling almost entirely affects the axis cylinder, which is markedly œdematous. It shows a finely granulated appearance, the fibrillæ, which are irregularly separated by the œdema. Many fibres in this region are similarly affected, and a considerable degree of vacuolation is to be observed.

In longitudinal section numerous small infiltrations are found

scattered along the course of the nerve fibres. In one instance a fibre which runs parallel to one of these can be observed from before the hæmorrhage commences till after it has ceased. In the first part of its course the axis cylinder is normal in appearance, then it is seen to become sharply wavy for a short interval; after this it becomes normal, but opposite the greatest extent of the infiltration it is again thrown into sharp waves and kinks which are larger than in the first instance, and involve a longer portion of the fibre. After a short interval in which it is normal, the axis cylinder is again thrown into waves in a manner similar in extent and character to the first instance. It then resumes its normal state and disappears from the field.

In another part of the section marked swellings are to be observed along the course of the nerve fibres at irregular intervals. In these enlarged spaces the axis cylinder is found to be kinked up, sometimes swollen, and often broken. One sees, in fact, the first stage in the formation of the myelin balls, which will be referred to later.

A particularly interesting condition is found in another region. The myelin sheath of a fibre is swollen and fragmented, and the axis cylinder shows three distinct enlargements at intervals along its course. The condition, though similar to that just described, is more pronounced, for the axis cylinder is in this instance formed into distinct loops, and the twists are more marked. Besides this, each swelling of the axis cylinder is surrounded by a pale membrane. Sometimes this assumes the form of an evenly distended tissue, or the contour of the membrane may be broken. It stains similarly to the glia tissue, and appears in fact to form a fine glia sheath around the axis cylinder.

As regards the glia elements, a decided increase of one form of the cells is noticed in the neighbourhood of the degenerating fibres. In this, as well as other sections, three forms of glia cells are to be distinguished. First, those which appear to be fixed in the tissue. They are frequently larger than the others, the cell is round, stains more deeply, and the chromatin bodies are generally very prominent. It is surrounded by a large mass of protoplasm from which numerous fibres are given off to form the supporting structure of the surrounding tissue. Second, a cell very similar to the first; it is also fixed in the tissue by a few fibres which are given off from the protoplasmic body, but neither the fibres nor

the protoplasm surrounding the cell are so well developed as in the first instance. The third form appears to lie free among the fibres. It is not surrounded by protoplasm, and no fibres are given off from it. It does not stain so deeply as the others, and the chromatin granules are not so evident. It is this form which shows an increase about the degenerated fibres. As will be shown later, this is due to the amœboid-like activity of these cells.

Marchi preparations show as in the previous case the Elzholz bodies, but no proper reaction to the osmic acid.

By the Scharlach R. method no traces of fat are to be found.

Case III. (*about* 48 *hours*).—*Captain Stokes.*

This patient arrived at the hospital moribund, and died without recovering consciousness. He had been wounded by a rifle bullet which fractured the first dorsal spine as well as the laminæ on both sides. The body and pedicles were not injured. The notes state that death occurred between twenty-four and forty-eight hours.

At the post mortem, when the laminæ were removed, the theca appeared to be quite normal. On cutting the cord there was an extensive hæmorrhage in the central grey matter three segments from the lesion. The portion of the cord forwarded for examination included from the fifth cervical segment to the fourth dorsal segment.

Captain Stokes calls attention in the notes (29th October 1915) to the fact that he had seen three cords in which there was an extensive microscopic injury, though there had been no direct contact of the projectile with the cord. He mentions that the remote effects of bullet injuries is not sufficiently recognised, which probably accounts for a great deal of the sepsis and delayed repair. This remark is based on his observations on the muscles, kidney, and liver, and he thinks that the three cases mentioned bear it out as regards the nervous system.

When the cord was examined at the laboratory, small scattered hæmorrhages were seen throughout the white and grey matter. These involved the whole portion of cord obtained, and were most marked in the upper region.

Bielschowsky preparations show the bead-like swellings sometimes found along the nerve fibres. In a small area of one section

all the fibres show this condition. The swellings, which vary in size, occur at more or less regular intervals. The myelin sheath is distended by the changes in the axis cylinder. This is seen to be bent and twisted, sometimes forming corkscrews, occasionally complete loops. In no case was the fibre broken, and between these swellings it was quite normal in appearance.

Mallory.—In an area infiltrated by a localised hæmorrhage which has spread along between the fibres, a very marked state of degeneration is to be observed. The nerve fibres show globular distensions which are more or less separated from each other by glia structure. These are filled with broken-up axis cylinders—blue, and portions of myelin-yellow. The axis cylinder pieces show a swollen and granulated appearance. The whole mass is surrounded by a glia ring—violet, and represents the early stage in the formation of the myeloclast.

Marchi.—Beside the Elzholz bodies, which are again observed, there are numerous other round masses which stain darkly, and are strongly suggestive of a true scattered Marchi degeneration. But the Scharlach R. still shows no sign of fat.

From the condition of the nerve fibres in this case I have considered it to be one of about forty-eight hours.

Case IV. (60 *hours*).—*Captain Stokes.*

A portion of a spinal cord from a case wounded by a rifle shot. The bullet passed through the first two rings of the trachea, which were fractured, and the œsophagus, and embedded itself in the body of the first dorsal vertebra. Tracheotomy was performed, but the man expired sixty hours after the injury. After hardening the cord was cut, when an extensive syringo-myelia was found to exist. The notes state that the sergeant had been doing his duty up to the time of his wound, and there was nothing to show that he had ever suffered any inconvenience. Sections made from the cord several segments above and below the lesion showed the following changes :—

Bielschowsky.—In various regions numerous axis cylinders are seen to be affected. They are bent, twisted, and frequently broken. The peripheral fibres are more affected than the central ones, and the vacuolation is more marked at the circumference.

Mallory.—Broken up masses of myelin are shown to be rolled

up into balls and surrounded by glia structure. Broken axis cylinders are found twisted up in the bead-like swellings of the sheath. Myeloclasts are numerous, that is, myelin debris and portions of axis cylinders rolled up into a ball, and surrounded by the processes of a neighbouring glia cell. Long lengths of fibres are seen in which portions of the axis cylinders are thrown into kinks and corkscrew twists.

Marchi.—Scattered throughout these sections numerous dark staining rounded masses are found along the course of the fibres. They are larger than the Elzholz bodies and much more numerous. Short portions of single fibres are found in which these changes can be observed. As has just been shown in the Mallory preparations, these rounded masses are myeloclasts containing fragments of myelin and axis cylinder. The function of these myeloclasts is to convert the myelin into fat at the place where the degeneration takes place, so that the products of the degeneration can be later carried off to the blood vessels. In the Marchi sections we find in many of these myeloclasts that the osmic acid has stained some of the debris black. In addition to this we find in the walls of some of the vessels minute black granules which are gathered together into isolated groups. These are exactly similar in appearance and distribution to the fat globules contained in the adventitial cells.

Herxheimer's Scharlach R. Method.—In these preparations we find scattered throughout the tissue minute fat globules lying along the course of the degenerated fibre. They are also to be observed lying free in the tissue. Sometimes they are gathered together into clumps when a confluence occurs, and large globules are formed. Glia cells, without any protoplasm surrounding them, are generally found in the vicinity. Sometimes their amœboid character is illustrated by the method in which they take up the fat. After the globules have become attached to the cell, protoplasmic processes are given off which surround them, and the fat is then gradually absorbed. In another area we will see these cells loaded with fat in the vicinity of the vessels. One vessel in particular is very instructive. Lying within its sheath is a glia cell, which is crammed full of fat globules both large and small. In one end of the cell the globules are crowded together forming a rounded mass, while towards the other end they taper off to a single cell. The rounded end of this cell is

in proximity to the ends of two adventitial cells. The adjacent ends of these cells, instead of tapering off to a point as the other cells in the vessel wall do, are broadened and rounded off as if suggesting a receptive condition, and between the cell loaded with fat and the adventitial cells some minute fat globules are to be observed. The whole condition indicates that the cell through its amœboid action has penetrated into the sheath of the vessel, and is in the process of giving off the fat globules to the adventitial cells. In other portions of the vessel endothelial cells are shown full of fat globules, and some globules appear to be free in the vessel wall.

Description of the Syringomyelia as shown in a Mallory Section from the Sixth Cervical Segment.

The cavity involves the central region of the cord, and is almost entirely surrounded by a thick sclerosis. In the grey matter we find that the commissure is about completely sclerosed, and there is a well-marked increase of neuroglia tissue throughout the lateral horns. The various cell groups, as well as can be observed by this method, appear normal. Several of the anterior root fibres can be observed passing through the white substance, and in both axis cylinder and myelin sheath there are no changes.

White Substance—Left Side.—The pia throughout is much thickened, but particularly on this side. The septa are greatly increased in size, and the neuroglia tissue of the antero-lateral regions shows a marked proliferation. There is a considerable scattered degeneration throughout these regions, but the majority of the fibres are normal. On the right side the fibres of the antero-lateral and lateral regions are normal.

Posterior Columns.—Roughly speaking, the central half of these columns has been destroyed. In the remaining portions there is a well-marked increase of neuroglia tissue. While many fibres have undoubtedly perished, there is only a scattered degeneration in this region, for throughout the thickened neuroglia fibres blue axis cylinders surrounded by the yellow sheath are everywhere to be seen. On the inner surface of the sclerosis a few ependymal cells were observed in this and other sections.

The degeneration resulting from this enormous cavity, which

could contain an ordinary pencil, are briefly as follows:—(1) The total destruction of the central half of the posterior columns on the left side, and a scattered degeneration throughout the remaining portion. (2) The central half of the posterior columns on the right side, excepting a small zone in the lateral region, are completely gone, and there is a scattered degeneration among the remaining fibres. (3) A slight scattered degeneration in the left antero-lateral regions from the neuroglia proliferations.

Case V. (7 *days*).—*Dr Kidd, London General Hospital.*

Extensive bullet wound of the head involving the left parietal and occipital regions. Death occurred one week after the injury. The investigation of the brain was not completed, but that of the cervical and dorsal regions of the cord is as follows:—

The Pal Weigert and Marchi methods in transverse section show no changes.

Bielschowsky.—Shows whole fields in which the fibres are undergoing degenerative changes. These are represented by long rows of swellings in which the broken-up axis cylinder is frequently seen. Numerous fibres in this area show marked kinking and twisting. In another section the normal condition of the fibres is to be seen. Some which stretch across the field show only a slight waviness of the axis cylinder. None of them show the kinks and twists to which attention has been called in the early cases. But again in this same section, at the circumference, a similar condition to the above, viz., a swelling of the fibre, is to be observed.

Mallory.—Sections show portions of the nerve fibre to be in the early stage of degeneration. The myelin is broken up and formed into balls which are surrounded by glia fibres. Sometimes a blue fragment of axis cylinder is also enclosed. These myelin balls form long rows along the course of the fibre. In some instances glia cells are to be observed in the neighbourhood. A cell which is near to the degenerating zone but still free in the tissue appears in its normal round form. Not infrequently a cell is found between the balls of myelin; it is then elongated and somewhat triangular, suggesting that it has reached its position by an amœboid-like action. More rarely still the glia cell is to be observed in close contact with and adapting itself to the rolled-

up fragments of myelin which in some instances it has enclosed within protoplasmic processes.

Scharlach R. preparations were not completed.

These sections from a case of one week show practically the same conditions as were found in the previous case of sixty hours. The explanation of the difference in the time taken to produce a similar stage of degeneration is, that in the case of sixty hours the injury involved the spinal column, while in this case it involved the brain.

Case VI. (11 *days*).—*Captain Stokes.*

The injury was caused by a bullet which penetrated the spinal canal at the level of the seventh cervical segment. The patient survived for eleven days. At autopsy it was found that half of the cord at the level of the lesion had been destroyed, and that the bullet had embedded itself in the spinal column.

A few sections stained by the Pal Weigert eosin method were forwarded to the laboratory for examination. The conditions found in these sections are as follows:—

At the level of the lesion, the seventh or eighth cervical segment, practically one-half of the cord was destroyed. What remains of the anterior horn of the grey matter is greatly disorganised. The vessels are congested, and there is a diffuse hæmorrhagic infiltration. The posterior horn is absent. In the white substance only a small region lying in front of the anterior cornu remains normal. The anterior root zone shows marked degeneration, but the fibres of the direct pyramidal tract are less affected. There is no trace of the lateral column. In the posterior columns the lateral is completely destroyed, but some portions of the median, which is extensively degenerated, remain.

In the other half of the section both the membranes and the roots are intact. In the grey matter very little pathological change is to be observed, excepting a small hæmorrhage at the base of the anterior horn. Of the motor cells only the antero-internal group is affected, due probably to the degeneration of the commissural fibres from the opposite horn. The anterior commissure shows a large number of healthy fibres, but in the posterior commissure there is extensive degeneration. The posterior horn is normal. In the white matter the root zone is

normal, but between the direct pyramidal tract and the grey matter there is an area of degeneration. There is also some scattered degeneration throughout the anterior and lateral columns. The posterior columns show a hæmorrhage near to the commissure which involves the neighbouring fibres. Many of the endogenous fibres lying in contact with the horn are degenerated, and there is an extensive scattered degeneration throughout both the internal and external columns.

Transverse section of the fifth cervical, two segments above the lesion. In the pia surrounding the cord, in the fibrous prolongations into the white substance, and scattered throughout the white substance, are many small hæmorrhages. On the right side, in the antero-lateral and in the dorso-cerebellar regions, they are very distinct. Hæmorrhages are also present in the posterior columns.

Throughout the white substance at the periphery there are numerous patches of degeneration. On the right side the areas are rather large, and occupy the antero-lateral and posterior cerebellar regions. The regions of the direct and crossed pyramidal, and the anterior cerebellar tracts are fairly free, though in these areas also many fibres have degenerated. On the left side, at the periphery, a few small areas of degeneration are to be observed in the cerebellar region. For convenience the degenerations are described as being located in the various tracts, though they are in no sense typical of tract degenerations. In the posterior columns the fibres are considerably affected. This is principally confined to the median, and like the others is most marked at the periphery. Scattered throughout the white matter generally are numerous swollen fibres, and as many of these have fallen out, the section presents a distinctly vacuolated appearance.

Grey Substance (side on which most degeneration is seen).—In the anterior horn there is extensive degeneration and some small hæmorrhages. The cells are diminished in number and somewhat pale. In the lateral horn the cells of the external and posterior groups are healthy looking. Of the anterior root fibres one bundle appears to be completely degenerated, and another group is partly so. The posterior horn and roots are not affected. On the opposite side the anterior root fibres are pale, but there is no definite degeneration; the posterior roots are normal. In the posterior commissure there is considerable

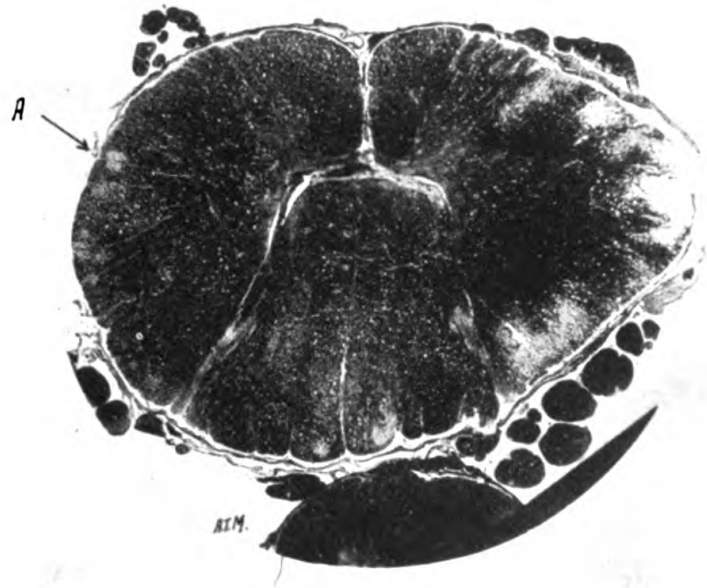


FIG. 1.—FIFTH CERVICAL, TWO SEGMENTS ABOVE THE INJURY.

Areas of degeneration around the periphery of the cord, principally in the lateral regions, and usually in connection with the septa. Tearing of the tissue along the septa is to be observed. Both in the white matter and in the grey the destruction of tissue is associated with hæmorrhages.

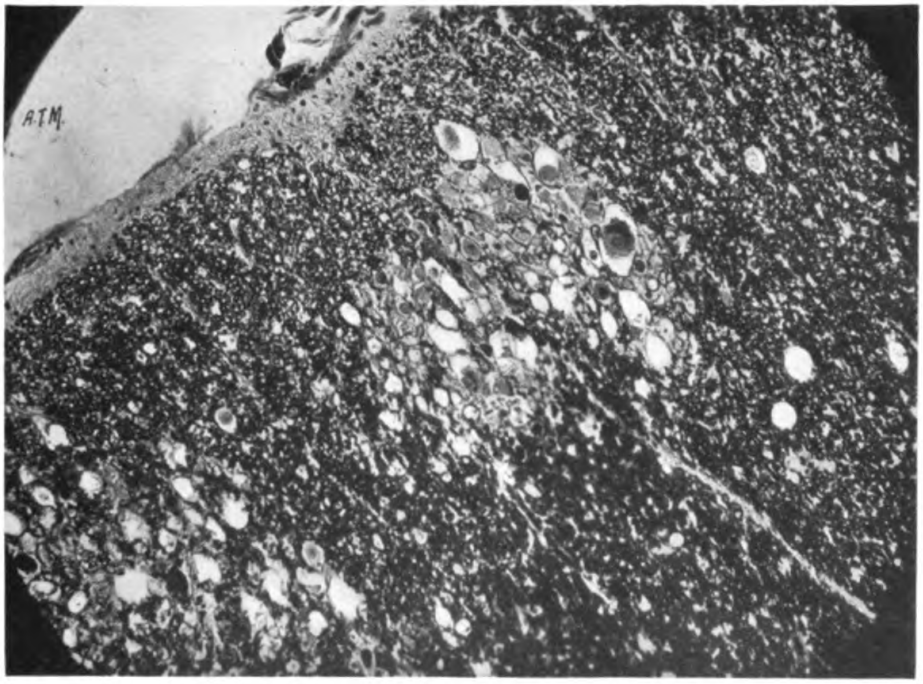


FIG. 2.

Enlarged from A in Fig. 1. The situation of a degenerated area on either side of a septum is shown. There is thickening of the pia, and proliferation of the glia cells. There is marked swelling of the fibres associated with distension of the neuroglia sheaths.

destruction from hæmorrhage and tearing, and this extends down into the posterior horn.

A closer examination of these degenerated areas (Fig. 1) reveals the fact that they are situated in particular around the septa which run from the pia into the cord substance. And that in addition to these a distinct tearing of the tissue along the course of the septa has occurred, associated with minute and localised hæmorrhages. A marked laceration of the grey matter including the commissure and both horns has also resulted. In the right half of the cord, internal to the posterior roots, we find the dura thickened and infiltrated with blood. Internal to this, in the region of the direct cerebellar tract, there is a focus of necrosis. Scattered throughout this area are numerous minute hæmorrhages. The nerve fibres are swollen, and a faintly staining sheath often alone remains. Many of the fibres have dropped out giving to the section a vacuolated appearance.

On the opposite side a small localised disturbance situated on either side of a septum shows in a remarkable manner the effects of the concussion. (Fig. 2 enlarged from A in Fig. 1.) Nerve fibres in various stages of degeneration are shown. In some instances the axis cylinders are only slightly swollen, and fill up completely their place in the sheath. In others they are larger and show minute deeply staining granules, and between the axis cylinder and the sheath there is frequently a large clear space due partly to the œdema, but principally to the falling out of the disintegrated myelin. In Fig. 3 one very large fibre is shown (300 diameters). In the centre of the fibre is the swollen axis cylinder, and this is surrounded by the degenerating myelin. Some debris partly fills the space around this mass. The whole is enclosed by glia structure, which is thicker than normal, and is broken in several places. Lying in the centre of the mass over the axis cylinder is a glia cell. The dark staining granules are probably fat. This condition of the fibre represents one of the stages in the formation of the myeloclast.

Besides these changes in the fibres the glia also shows some interesting developments. As has already been mentioned there are numerous open spaces scattered through the section where the nerve fibre has fallen out. These spaces are surrounded by a glia structure which had previously formed the sheath of the nerve. Within this glia ring which is generally thickened fine fibres are

frequently observed. These usually make their first appearance at the circumference where they form a network which gradually extends until the space becomes filled up. Sometimes, though, one or more fibres will bridge across the opening, and from these others will be formed till a firm interlacing structure fills the space. A similar condition is also to be observed where the neuroglia has been torn. Through this neuroglia proliferation the damaged structure of the cord is bound together with a firm tissue which will eventually develop into a sclerotic mass. These changes are of particular interest in that they have been observed in a case of eleven days. It is, though, only another of the many evidences which show that the stages of degeneration in these traumatic cases vary greatly from the usual type.

In the section from the first dorsal level (Fig. 4) there is some congestion of the vessels of the pia and septa. In the white matter there is a small localised area of degeneration in the region of the anterior cerebellar tract. In the posterior columns a small area is affected amongst the endogenous fibres caused by a hæmorrhage extending from the posterior commissure. Throughout the white matter a number of degenerated fibres are to be seen. These are more numerous in the columns of Goll and Burdach, and many of them have fallen out.

The Grey Matter on the Side of the Degeneration.—In the anterior horn the cells appear normal, excepting those of the antero-lateral group which show considerable degeneration. The anterior root fibres are also affected. The posterior horn is normal and the fibres of the root zone are healthy. In the lateral region of the grey matter a few small hæmorrhages are to be seen, and there is some degeneration of the cells. On the opposite side the grey substance appears healthy throughout; the cells and nerve fibres are normal. In the posterior commissure there is a small hæmorrhage which extends towards the post horn, and into the posterior columns where it has produced a small area of degeneration on either side of the median fissure.

A Section from the Third Dorsal Segment.—There are many small hæmorrhages in the pia and septa. The superficial neuroglia is increased, and there is a distinct proliferation of the cells. The white matter shows in the anterior and lateral columns some scattered degeneration. In the posterior columns the degeneration is more marked, and the vacuolation more evident. There are no

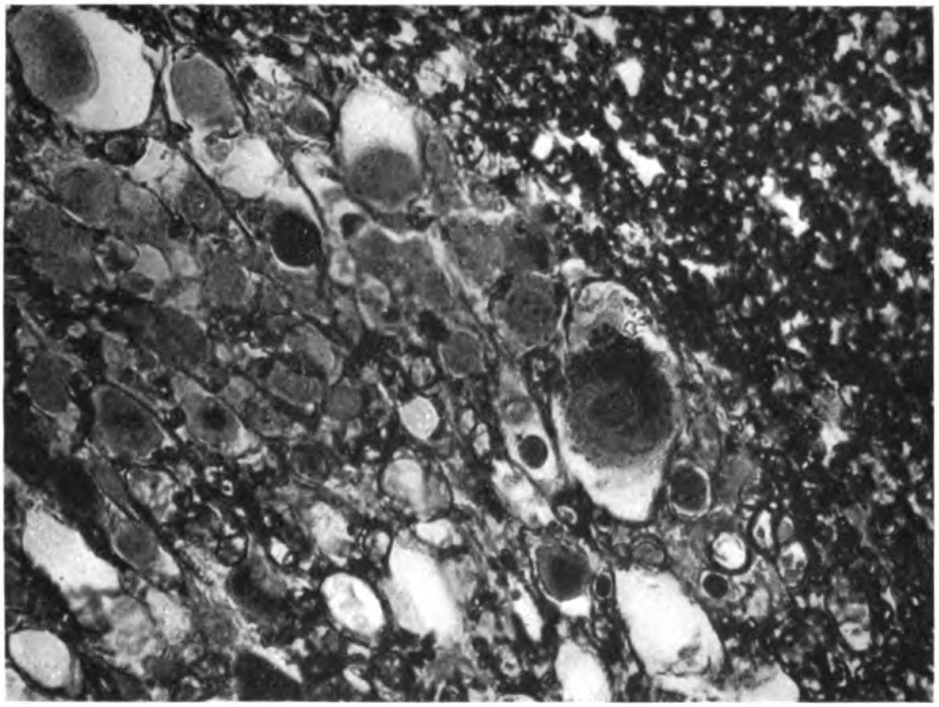


FIG. 3.

Fig. 2 enlarged 300 diameters. Enormous swelling of the fibres. In some the myelin has dropped out, leaving a space about the swollen and degenerating axis cylinder. The large fibre on the right shows the axone, greatly increased in size, surrounded by the thickened myelin sheath. About this some debris is to be observed in the space between the fibre and the neuroglia sheath. Lying on the axis cylinder in the centre of the mass is a glia cell, the two rings of the axone and the cell being clearly shown. The surrounding dark pigment is probably fat.

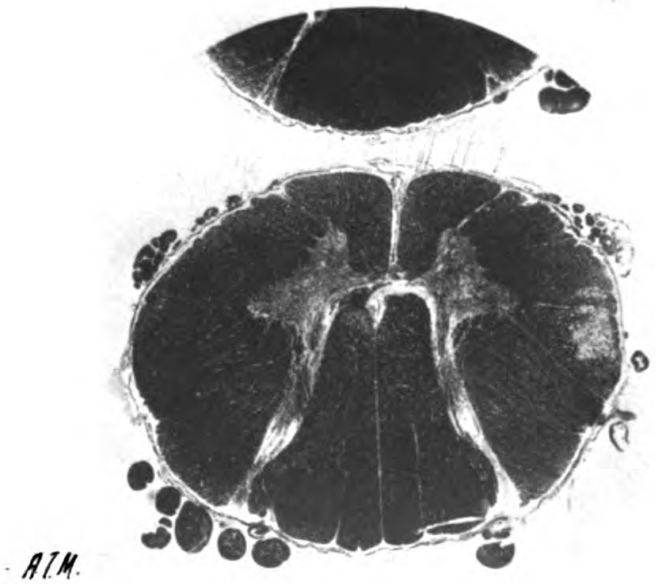


FIG. 4.—FIRST DORSAL LEVEL—ONE SEGMENT BELOW THE LESION.

A localised area of degeneration at the circumference is to be observed. It is connected with many of the smaller septa and one large one. There are also several small patches of degeneration in the antero-lateral region about the septa. Degenerations in the right anterior roots. Hæmorrhages in the grey matter.

definite areas of degeneration, but the periphery is stained paler than the central regions, suggesting a slight degree of annular sclerosis.

The Grey Matter.—In the left anterior horn there are some small hæmorrhages, and the cells of the anterior groups and their nerve roots show degeneration. The lateral group of cells and fibres are also affected. The vessels throughout are congested, and there is considerable infiltration of the tissue with blood cells. Around Clarke's column the vessels are particularly congested and the cells are degenerated. There is a marked proliferation of the glia cells. In the posterior horn the fibres and the root zones appear normal. In the anterior cornu the anterior, mesial and lateral groups of cells and some of the root fibres show degeneration. The commissure and the posterior horn are torn, and there is considerable destruction of tissue with infiltration of blood.

Section from the Sixth Dorsal Segment.—The staining is faint, neither the fibres nor the cells show up well. Throughout the grey matter in scattered areas a number of large and small fibres have fallen out. The crossed pyramidal tracts and the posterior columns are particularly affected, though in the latter the periphery is almost free. In the grey matter the cells of the right anterior horn are faintly stained and there is considerable degeneration in the anterior root fibres. On the left side the cells and root fibres are normal. In another section from the same level, two small hæmorrhages are found in the central portion of the posterior column.

Section from the Seventh Dorsal Level.—There is a slight scattered degeneration of the fibres in the posterior columns. The area involved is almost limited to the central region, the fibres near to the commissure, in the root zones, and on the periphery being almost free. In other respects the section is normal.

Sections from the eighth and ninth dorsal segment show practically a normal condition.

Case VII. (7 *weeks*).—*Dr Head, London General Hospital.*

Bullet wound of the spinal column at the level of the twelfth dorsal vertebra. The skiagraph showed twelve large fragments and several small ones in this region. After an illness of several weeks, during which septicæmia and broncho-pneumonia

developed, death occurred. The post mortem showed a chronic purulent inflammation within the spinal canal. On opening the thickened dura there was much congestion of the surface of the cord and among the roots descending into the lumbar plexus. The greatest thickening was over the third, fourth, and fifth lumbar and first sacral segments. The cord was firm and on section showed no areas of softening to the naked eye.

Pal Weigert.—Second lumbar, complete degeneration of both posterior columns. Sixth dorsal and third cervical, complete degeneration of the posterior columns, and slight in the cerebellar tracts.

Bielschowsky.—Shows large areas in which the majority of the fibres are completely degenerated. The myelin and axis cylinders are broken up and formed into balls which extend in long rows along the course of the fibres. In others the axis cylinders are slightly swollen and twisted. Among these a few fibres are always to be observed which are still quite normal in appearance.

Mallory.—This section shows the various stages of degeneration from the earliest to those well advanced. Many of the fibres are quite normal, and can be observed pursuing a straight course across the field. In the degenerated areas we find the axis cylinders twisted, thrown into kinks, and broken. The myelin is generally broken up and formed into irregular masses, which are distributed along the course of the fibres. In other areas, where the condition is more advanced, the myelin is rolled up into balls, which sometimes include the broken axis cylinder. These are enclosed by a glia ring. We will also find that this mass will become surrounded by the processes from a glia cell, or a glia cell will find its way into it, and the myeloclast thus formed is then ready to begin its function of converting the myelin into fat. The final stage to be observed in this section is the formation of the myelophagocyte. This second form of scavenger cell is developed from the glia cell, with a rich protoplasmic body surrounding it. When one of these cells comes into relation with a myeloclast it gradually encloses it by means of processes given off from the protoplasm, and the whole myeloclast, including the myelin, axis cylinder, and glia cell, is taken into the larger cell. In other instances some of these myelophagocytes will surround four or five myeloclasts. Processes are then given off which find their way in and around the degenerating material until it is all

enclosed. In the later stages we will see how these cells act on these disintegrating masses.

The multiplication of the glia cell by a process of mitosis is also to be observed in this case in different stages of its development. The earliest stage found shows an elongated protoplasmic body containing two glia cells at opposite poles. Both cells and protoplasm stain faintly, and the chromatin granules are very indistinct. Later we find that the protoplasm is beginning to divide, though it is still united by a narrow portion. Across the interval, which partially separates the protoplasm, are stretched a few fine threads. A still later stage shows that the division of the protoplasm has been completed. The adjacent walls of the protoplasm are parallel to each other and separated by a narrow space. Finally we can observe the cells completely separated and enclosed in a rounded-off body of protoplasm. Throughout the whole condition both the protoplasm and the cell stain faintly.

Marchi in Transverse Section.—The picture is similar to the Pal Weigert. In longitudinal section the nerve fibres are completely broken up, the debris being rolled up into balls which extend along the course of the fibres. The masses of the degenerating material vary greatly in size. Some are very large and contain several myelin fragments in various stages of degeneration, as shown by their black or brown staining, others are quite small. Numerous spaces are seen where the large scavenger cells, the myeloclasts, and the myelophagocytes have fallen out.

Case VIII. (2 *months*).—*Dr Feiling*, 13*th General Hospital.*

In this case the wound was from a shrapnel bullet which struck the vertebral column, just below the spine of the left scapula. There was immediate loss of power in the arms and legs, associated with retention of urine. Sensation was lost up to the fourth cervical segment. X-rays showed the bullet to be lodged in the canal just to the right of the spinous process of the sixth cervical vertebra. A laminectomy of the fifth, sixth, and seventh cervical was performed a few days later and the bullet removed. It was found within the spinal canal, lying to the right of the theca which appeared uninjured. After two months' illness, during which his condition got steadily worse, he died from respiratory failure. At the level of the injury, which

involved the fifth and sixth cervical segments, the dura was strongly adherent to the pia, and the substance of the cord at this point was much damaged. On section gross macroscopic changes, softened areas, were observed extending upwards to the fourth cervical segment and downwards to the third dorsal. In the left posterior horn, extending from the second to the fifth dorsal segments, a small localised patch of necrosis was observed.

Mallory—Transverse Section from the Third Dorsal Segment.—There is marked degeneration of the pyramidal tracts as well as the posterior columns. Fibres in all the early stages of degeneration are to be seen scattered throughout the section, myelin balls, myeloclasts, myelophagocytes. In the left horn there is a large necrotic area, which is surrounded by a narrow margin of grey matter. Its probable origin was a hæmorrhage. The vessels throughout the grey matter are markedly congested.

Marchi Counterstained by Mallory.—In this section one can still see the axis cylinders to be broken and twisted and surrounded by degenerating myelin; also yellow or yellow-brown Marchi balls forming rows along the course of the fibres. In some cases, even at this stage, the remains of the axis cylinder in the rolled-up balls of myelin are still visible. Myelophagocytes are also present and are seen to contain partially-converted myelin, as shown by its yellow-brown colour, and myelin that is completely degenerated and is stained black.

In another section, through a degenerated area, a great increase in the glia structure is seen. This ramifies throughout the whole region, surrounding and binding together the spaces left by the disintegrating fibres. The course of these fibres is marked by swellings containing large masses of black staining degeneration products, broken-up axis cylinders, myeloclasts, myelophagocytes, and here and there a granular cell. This later development of the scavenger cell is found in this and other sections in various stages of activity. In the early stage it is somewhat irregular in form, contains a single deep blue staining nucleus, and its body is filled with a fine net-like pale blue structure. Yellow staining myelin in the process of conversion, and sometimes long rolled-up bits of blue axis cylinder, are to be observed within the meshes of the cell. In a later stage we find that in the network of the cell numerous large and small vacuoles have developed which contain large dark staining masses of degenerated myelin. No axis

cylinders are to be observed in the cell at this stage. The cell may contain two or more nuclei according to the manner in which it has been formed. Still later we see some of these cells in a degenerating condition. The nucleus has lost its full rounded form and may appear shrunken or distorted, it stains poorly sometimes a blue-brown, and the chromatin granules are not now recognisable. Many of the vacuoles among the meshes of the cells are empty, and the black staining degenerating products may be observed protruding from the cell wall, lying in close contact with the outer margin of the cell, and also as free masses in the immediate vicinity.

Some myelophagocytes are still to be observed which contain the yellow myelin and the blue axis cylinder fragments, indicating that in those regions the process of degeneration is in an early stage. Throughout the degenerating areas, where the fibres have completely disappeared, we find that the spaces have become filled with a homogeneous substance. In some cases this shows signs of breaking up, and fine fibres are beginning to make their appearance at the circumference. This change indicates that already at two months the beginning of the final stage has in certain areas begun, and that by the gradual increase of these fibres the process will be continued until the region is converted into a firm sclerotic mass.

Case LV. (4 *months*).—*Dr Head.*

The injury was caused by a rifle bullet which traversed the back of the neck, fracturing in its course the spinous processes of the sixth and seventh cervical vertebræ. Immediately following the injury he was paralysed from the waist down, but could move his hands and arms. After an illness that lasted for four months, which was complicated by incontinence of urine and fæces, the development of severe trophic disturbances, abscesses over the hip, and a large abscess in the abdomen, death occurred. At the post mortem it was found that the greater part of the seventh spine had been shot away, and that the caudal half of the sixth and the laminæ of the seventh were soft and friable. An irregular transverse fracture was visible across the laminæ of the sixth, with crushing on either side of it. The bodies and transverse processes of these vertebræ were not affected. From

the second dorsal segment to the sixth cervical the cord looked bruised. Below and above this area it appeared quite normal.

Toluidin blue sections from the fifth and eighth cervical; second and sixth dorsal; and second lumbar were examined. The condition in all was practically the same. The cells stained faintly, in many cases they were distinctly swollen, and the tigroid bodies which were very pale frequently showed granulation. As the cells throughout the whole cord showed distinct chromatolysis, the condition was evidently the result of the general septic state.

Pal Weigert.—Section from the fifth cervical, three segments above the lesion. There is complete degeneration of the posterior median columns, a marked degeneration of the direct cerebellar tract, and in the antero-lateral regions the fibres show a very pale staining. At the level of the lesion, which involved principally the second and third and to a less extent the first and fourth dorsal segments, there was a laceration involving the central region of the cord, which had resulted in the formation of a cavity. The degeneration due to the pressure and to the disturbance from the shock resembled a condition of almost complete transverse myelitis. The posterior and the right lateral columns were quite gone. The left lateral takes a very pale staining, as do also the antero-lateral regions. In the seventh dorsal segment there is complete degeneration of the crossed pyramidal and the direct cerebellar tracts as well as in the marginal zone of Lissauer. Anteriorly in the direct pyramidal tracts and throughout the antero-lateral region there is a well-marked degeneration. In the second lumbar segment the degeneration involves the crossed pyramidal and the direct cerebellar. And extending along the border of the anterior regions a number of degenerated fibres are also seen.

Mallory—Transverse Section from the Fifth Cervical Segment.—In the lateral column the degeneration in some of its early stages is still to be seen. Many of the fibres are enlarged, the myelin is swollen and fragmented, and the axis cylinders are greatly increased in size and often broken. There is also a marked increase in the glia cells. In some instances the glia cell is seen to have found its way into the degenerating fibre and is to be found with the axis cylinder occupying the centre of the myelin.

The posterior median columns show complete degeneration.

There is an enormous increase in both the neuroglia tissue and the cells. The fibre spaces are filled with granule cells and surrounded by thick masses of glia structure. In longitudinal section the condition of the neuroglia fibres is particularly well shown, and it is seen that the greatest increase is in the fibres which run parallel to the nerves, but crossing these in all directions are numerous fibres which give to the structure a web-like appearance. Myelophagocytes are also to be found. In some instances they have not yet completed their function, and we find in their meshes some remains of yellow staining myelin substance. In the granule cells which have completed their activities we find that the web-like structure has given place to a homogeneous mass, and that the nucleus has disappeared. Later it begins to shrink and in the space between the degenerating cell and the enclosing glia structure fine fibres make their appearance. This condition, which has already been observed in the second month, progresses until the space is filled. This stage in the general process of repair is much further advanced than in the previous section. In some areas the broken-up appearance of the degenerating mass has already given place to a regular fibrous condition from which all debris has been removed and which is now in a state that will gradually develop into a firm sclerosis.

Summary of the Changes Observed in the Previous Cases.

Case I. (10 *hours*).—While the majority of the fibres throughout the section are normal, some areas have been distinctly affected. The axis cylinders show sharp bends and twists. Swellings at regular intervals have also been observed generally associated with fibrillation and occasionally with rupture.

Case II. (24 *hours*).—Axis cylinders show twists, kinks, and complete loop formations. Swelling and œdema are also present. The myelin sheath may be distended, due to the kinking and breaking up of the axis cylinders. Peculiar vibration effect on a nerve fibre from the shock of the concussion is shown. Opposite a hæmorrhagic infiltration, which is surrounded outside of the affected zone by normal tissue, an axone has been thrown into short sharp waves. These are greatest in the centre of the disturbed portion of the fibre and gradually subside in both directions till they disappear entirely. On each side of the

central disturbance the axis cylinder is normal for a short distance. The fibre is then again disturbed on both sides of, and at an equal distance from, the first portion affected. These last two wave-like conditions are similar to each other but are shorter and less marked than in the first case. A long length of fibre can be followed on either side of these, but nothing further is to be observed. On some of the affected axis cylinders a sheath-like structure is apparent.

Case III. (48 *hours*).—The axis cylinders are bent, twisted, show corkscrew formations, and complete loops, also swelling and fragmentation. The myelin is swollen and broken up into globular masses which include bits of axis cylinder. The whole mass is surrounded by a glia ring forming the myelin ball.

Case IV. (60 *hours*).—The axis cylinders are broken and the myelin is fragmented. Numerous myelin balls are to be observed. Myeloclasts, the first form of the scavenger cells, are now found. These are seen to be formed by glia cells which have surrounded with protoplasmic processes the myelin balls. First traces of Marchi degeneration found in the myeloclasts. Fat is also found in these cells; free in the tissue, in the glia cells, and in the vessel walls. The presence of the fat in these advanced stages will be considered later.

Case V. (7 *days*).—Myelin balls form long rows along the fibres. Formation of the myeloclast is to be observed as well as the amœboid-like activity of the glia cells. The condition in this case is not quite so advanced as in the previous one. This is due to the fact that in Case IV. the injury involved the spinal column while in this instance it involved the brain.

Case VI. (11 *days*).—As there were only a few sections stained by Pal Weigert available, it is impossible to describe the changes minutely. The photographs show marked swelling of the axis cylinders and vacuolation of the fibres. The large fibre in Fig. 3 appears to contain a glia cell directly over the axis cylinder. Such a condition is frequently found in the early stages of the degeneration, and the granules observed in the central area resemble more in size the chromatin granules of an active glia cell than the cut ends of the fibrillæ. In addition to this, two distinct rings are to be seen even in the picture. By this method, though, none of the finer details can be studied.

Case VII. (7 *weeks*).—All the early stages of the degenerative

process are represented from the first disturbances of the axis cylinder and myelin sheath, to the myelin balls and myeloclasts. In addition to this we find the second form of scavenger cell present. This is seen in the stage of its formation when a glia cell rich in protoplasm surrounds a myeloclast, or where several glia cells each surrounded by a protoplasmic body enclose within their processes several myeloclasts. Some of these myelophagocytes have evidently been active for some time, as the myelin has been broken up into small masses which are sometimes shown as bright yellow balls within the blue protoplasm of the cell, or in the Marchi preparations as black fragments. Proliferation of the glia cell by mitosis is also to be observed in this section.

Case VIII. (2 *months*).—In all these later stages the early conditions are always to be found at the margin of the degenerating area. Thus we see again the axis cylinder and myelin sheath in various conditions, the myeloclast, and the early myelophagocyte which may still show within the enclosed myelin some axis cylinder fragments. In the later stages of the activity of this cell the axone has disappeared. The original irregular outline of the cell has now given place to a more or less rounded form. The homogeneous mass of protoplasm has also changed, fibres have been developed which have divided still finer the enclosed myelin masses, and the cell body shows a granular appearance. In this manner the granular cell is formed. Marchi preparations show the black staining degenerated myelin within these cells. In a few instances granular cells are found which are apparently undergoing degeneration. The cell body has lost its granular appearance. It has begun to shrink, and in the space thus left between the cell and its greatly thickened surrounding structure of neuroglia tissue, fine fibres begin to make their appearance. These develop in the form of a network around the circumference. This represents the earliest manifestation of the final stage.

Case II. (4 *months*).—The conditions observed here differ from the previous case only in the more advanced state of the degeneration. The degenerated area is occupied by a mass of granular cells. In some regions the debris has all been removed, and the irregular broken-up condition of the disintegrated mass has given place to an ordered state in which there is a great proliferation of fibrous tissue. From this time on a regular progress will be made until the affected area has become completely sclerosed.

In regard to the changes observed in the cases of 10, 24, 48, and 60 hours, which are probably the earliest of this nature reported upon that have been carefully examined, attention is drawn to the fact that in these injuries the disturbances described have been directly caused by the shock of the traumatism, and are not in the earliest stages secondary degenerations in the usual meaning of that term. And this gives rise to the question whether it would not be advisable to call the changes resulting from injury associated with severe shock "traumatic degenerations" so as to make a distinction between them and the usual secondary form.

As long ago as 1876, when Schiefferdecker studied the finer histology of secondary degeneration in the Goltz spinal dogs, he distinguished between the ordinary type of degeneration and the traumatic form. Since then no particular distinction has been made. In civil life these cases occur so seldom, and the difficulties of obtaining the material are so great, that it is practically impossible to collect a series; and with operated animals, whether the cord is partially divided by section or injured by a blow from a small weight attached to a metal arm 12 to 18 in. in length, as is usually done, the result is practically the same. Though in one case the cord has been crushed and in the other it has been cut, the degenerations that will result will be of the usual secondary type. But in injuries due to bullet wounds the concussion caused by the impact of the bullet, which at 200 yds. would strike the body a terrific blow in a $\frac{1}{800000}$th of a second, produces a tremendous vibration, the effects of which are transmitted through the dura to the spinal fluid, ligaments, pia, and septa into the cord substance; and wherever the final effects of these vibrations are felt there we find a laceration of the supporting structure, haemorrhages, and injuries of the nerve fibres. These lesions are actually the expression of the effects of the traumatism. The character of these changes differ, both in regard to the localisation of the lesions and the manner in which the tissue and fibres are affected, from that of the usual type of secondary degeneration. In the first instance the areas involved are scattered, and have no relation in regard to their situation to primary lesions above or below them. The lateral regions of the cord are most frequently involved, though disturbances are also found elsewhere throughout the cord substance, and generally along the course of the septa. In no case was any

disturbance of the spinal medulla associated with the anterior or the posterior roots. Besides this, localised destruction of the cord substance is always to be observed—if carefully looked for by modern methods—in regions many segments removed from the seat of the injury. Again, the progress of the degeneration is much more rapid in the traumatic cases, especially in the early stages, so that at 60 hours we find a Marchi degeneration and the presence of fat in the tissues, while in the usual type of secondary degeneration these are not found till after the fourth or fifth day. Taking into consideration all these facts, it has been considered advisable to classify these cases under the term "traumatic."

That doubt still exists as to these early changes is shown by a statement that has recently been made in regard to a case, that as death had taken place 48 hours after the injury there was no time for degenerative changes to have occurred in the white matter. As has been shown in the first three cases of this series, viz., 10 hours, 24 hours, 48 hours, a whole sequence of events has taken place during this time. The axone has been bent, twisted, and broken up into short lengths; the myelin sheaths have been ruptured, and single portions, sometimes including bits of axis cylinder, have been rolled up to form the myelin balls. That these changes form part of the degenerative process, if any doubt remains, is proven by the next case of 60 hours, that is, 12 hours later.

In Case IV., 60 hours, we find that the myelin balls have become surrounded by the processes of the glia cells, and the myeloclasts thus formed have already converted some of their contents into fat. This is shown by the definite Marchi reaction, and the demonstration of fat by the Scharlach R. method in these cells and free in the tissue.

In the notes of the case reference was made to the condition of syringomyelia that was found to exist. It formed a large central cavity capable of containing a pencil, and extended through several segments in the lower cervical and upper dorsal regions. The man, a sergeant, had been performing his duties quite normally up to the time of his injury. Unfortunately the presence of this condition confuses the findings, and one naturally asks whether the early Marchi degenerations observed, and the presence of fat in the cells and the tissue, are not due to the

degeneration resulting from the syringomyelia rather than to the disturbance produced by the injury to the spinal column. A point of considerable importance was the finding of some ependymal cells lining the cavity, for the opinion has been advanced by Schlesinger, that when a median cavity is lined by these cells the syringomyelia could probably be attributed to developmental origin. If that is so, then the condition is more easily understood. For the fact that the man was apparently quite normal shows that there could not have been much disturbance from this cause, which would be accounted for by the condition progressing so slowly, involving only individual fibres, so that it was possible for other fibres to take on the function of those destroyed.

From the Mallory sections we learned that some tearing of the tissue had occurred along the paths of the septa; that myelin balls had been formed of the broken-up sheaths and the axis cylinders, and that these had been surrounded by the protoplasmic processes from the glia cells. That, in fact, the stage of the myeloclast had been reached, the function of which is to convert into fat the broken-up myelin. The axis cylinder dissolves up and is absorbed from the tissues. From this we see that the stage was set for the production of the fat. And the time, 60 hours, is sufficient for the degeneration of the myelin to have occurred. Jakob found it in the rabbit 55 hours after hemisection of the cord, and Doinikow 48 hours after dividing the peripheral nerves. From this it would appear safe to say that the fat globules found in the myeloclasts, or free in the tissue, or surrounding or in a glia cell, could be from the degeneration produced by the injury. The question of the origin of the fat globules contained within the cells found within the vessel sheath presents a more difficult point to determine. Unfortunately no material was available to confirm or disprove it. Neither has reference to the literature given much satisfaction. It has been shown that 24 hours after section of a peripheral nerve fragmentation of the myelin, with swelling and kinking of the axis cylinder, was observed; after 48 hours myelin balls were formed, there was a granular disintegration of the myelin, and the appearance of fat droplets in the plasma of the cells of Schwann; at 96 hours fat was found in the fixed tissue cells of the endoneurium. In spinal cases we learn that when 96 hours have elapsed after a hemisection of the cord there is fragmentation of the axis cylinder,

breaking up of the sheath, the formation of myeloclasts and myelophagocytes; Marchi degeneration is also found, accompanied by fat drops in the myeloclasts and myelophagocytes, free in the tissues and collected in groups around the glia cells. From this we see that the changes in the peripheral nerves have progressed more quickly than in the spinal cord, and also that they correspond practically with the changes observed in this series. Also the traumatic influence in our cases would cause the changes to develop more rapidly, so that we might compare the results at 60 hours with those of Jakob's at 96 hours. On the other hand, if one takes the stand that the fat globules in the cells and in the sheaths of the vessels are due to the degenerations resulting from the syringomyelia, then it presupposes that the secondary changes are of long duration. If that was so, one would expect to find evidences of it in the way of a more pronounced Marchi degeneration, granular cells, &c. As these were not observed as the cavity was almost completely surrounded by a sclerotic band, and as no symptoms were present during life, it would appear that the degenerations reported were the result of the injury, and had no connection with the syringomyelia.

It is a point of some importance whether such advanced changes can occur in so short a time. But as it cannot be decided by discussion, it must be left to some future investigator to determine.

In Case II. mention has been made of a pale membrane which forms a sheath-like structure about the axone. This condition has been observed in several instances where the early breaking up of the fibre occurs. In these cases, when the axis cylinder is bent, twisted, or formed into loops, the disturbed portion is seen to be surrounded by a faintly staining membrane. This is sometimes quite even in outline, but occasionally its contour is broken and the ruptured ends are curled up. Paladino showed that in man the glia structure could be followed to the axis cylinder, around which it formed a sheath-like structure, and Held has confirmed these observations. Jakob has also shown such a sheath to be present.

Regarding these injuries to the central nervous system from the shock of concussion, one sometimes wonders what it actually means to be struck by a bullet at 100 or 200 yds., for the bullet of the service rifle has a very high velocity, and the shock of the impact must be enormous. On making inquiries I was

referred to the Shooting Editor of the *Field*, who very kindly has written me on the subject under date of 2nd May, as follows:—

"In confirmation of the promise made by me per telephone, I submit the following values relating to the ·303 Mark VII. service bullet weighing 174 grains.

Range.	Velocity.	Striking Energy.
Muzzle	2,450 ft. per sec.	1,490 ft.-lbs.
50 yards.	2,339 ,, ,,	1,360 ,,
100 ,,	2,231 ,, ,,	1,240 ,,
150 ,,	2,126 ,, ,,	1,120 ,,
200 ,,	2,020 ,, ,,	1,010 ,,
250 ,,	1,920 ,, ,,	916 ,,

"The foot-pounds unit of energy is the accepted method of expressing the striking power of projectiles of diverse weight and velocity. Just as falling bodies may have any weight, and may fall from any height, and yet be reducible to the common denominator derived from multiplying the two together, the product being an exact quantity of work, so projectiles are reduced to the same measure. The basis of calculation is the height from which a bullet would have to fall in vacuum to strike earth at the velocity in question. When so reduced to gravity conditions, the complex idea of diverse heights and weights is converted into foot-pounds.

"The actual force denoted by any given foot-pounds energy depends on the resistance offered. Thus, assuming that a bullet strikes the body at 200 yds. with 1,000 foot-lbs. energy, and is pulled up in 3 in. by the skin, muscles, and spinal column, the resistance offered by the tissues is on the average 1,000 divided by ·25 (viz., the fraction 3 in. is of a foot) equals 4,000 lbs. This 4,000 lbs. being the resistance offered by the tissues, it may be regarded as the static pressure of the bullet acting against the tissues. This would only be the mean resistance over the 3 in., since the opposing force would be greater during the early stages when the velocity was high than during the later ones when it had diminished. When bullets are directed against water containing mediums they set up a hydraulic force which acts radially

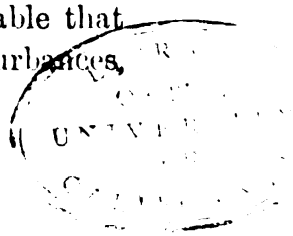
throughout the mass. At velocities exceeding 2,000 ft. per second this tendency has been found to be very much more pronounced than below that limit, so much so that the term 'explosive' has been adopted to express the idea of the suddenly applied hydraulic force.

"When the older type of comparatively blunt-nose bullet gave place to the pointed form, big game shooters, in their endeavour to account for the large area of the wounds produced, jumped to the conclusion that the bullet must turn and travel sideways, that is, rotating around its shorter axis. Personally I did not accept this view for two reasons:—First, the as-a-rule lighter weight and better ranging properties of the pointed form of bullet. increased the proportion of shots hitting above the 'explosion' level of velocity; second, the wedge shape of the pointed form would be more likely than the punch shape of the older type to set up a movement in the tissues radially to the path of the bullet, Motion so set up would be continued by inertia after the bullet had gone by, and the tissues so set in motion would drive against other tissues adjoining, and so greatly increase the area of the contusion as compared with the actual cross section of the true line of passage of the bullet. This idea has, I think, been accepted as a result of war experience.

"*P.S.*—The Mauser bullet is a little lighter than the ·303 Mark VII., it has a higher velocity, and would produce a more serious wound."

It is not surprising, therefore, that the impact of such a force produces tremendous disturbances, and also that these so frequently occur at regions remote from the seat of the injury. In this respect the letter supports the idea that shock effects can be transmitted to the spinal fluid where "they set up a hydraulic force which acts radially." And this force, by vibrating the cord, would cause it to pull on its attachments to the ligaments, which would result in the tearing of the tissue in the lateral regions and along the septa.

In this connection it would be of interest to examine the spinal cords, and especially the medullary regions, in cases of sudden death from concussion, produced by the explosion of a shell without causing direct injury. For, from the results of the investigations in these cases, it would appear not improbable that another form of concussion might produce similar disturbances.



and as the cervical region would in these cases probably feel the effect of the shock most, so we might find areas of localised destruction of tissue involving the vital centres.

In conclusion, I wish to express my appreciation to those whose efforts to obtain material have made this research possible. And I want to thank Captain Adrian Stokes particularly for the trouble he has taken to collect the valuable specimens which he so kindly forwarded, without which it would have been impossible to complete the splendid series that has formed the subject of this investigation.

I am also deeply indebted to Colonel Adami for the interest he has shown in the work, and for advice and assistance so generously extended to me.

References.

Alzheimer.—"Beiträge zur Kenntnis der pathologischen Neuroglia und ihrer Beziehungen zu den Abbauvorgängen im Nervengewebe." *Histol. u. Histopathol. Arbeiten*, Band III., Heft 3.

Doinikow.—"Beiträge zur Histologie u. Histopathologie des peripheren Nerven." *Histol. u. Histopathol. Arbeiten*, Band IV., Heft 3.

Held.—"Über den Bau der grauen und weissen Substanz." *Arch. f. Anat. u. Physiologie*, 1902.

Holmes.—"Spinal Injuries of Warfare." Goulstonian Lectures for the year 1915. *B.M.J.*, Nov. 27.

Jakob.—"Über die feinere Histologie der sekundären Faserdegeneration in der weissen Substanz des Ruckenmarks." *Histol. u. Histopathol. Arbeiten*, Band V., Heft 1, 2.

Paladino.—"Della continuazione del neuroglio nello scheletro mielinico delle fibre nervose et della constituzione pluricellulare del cilindrasse." *Rendiconto dell' Acad. di Napoli*, 31, 1892.

Tooth.—"Secondary Degenerations of the Spinal Cord." Goulstonian Lectures, 1889. *B.M.J.*, Vol. I.

Abstracts.

BRAIN, &c.

REPORT ON THE LATER RESULTS OF GUNSHOT WOUNDS OF
(543) **THE HEAD.** P. SARGEANT and G. HOLMES, *Journ. Roy. Army Med. Corps*, 1916, xxvii., Sept., pp. 300-311.

THE later results of head wounds seem to be much more satisfactory than had been generally expected. The proportion of patients who die after transference to England is small. Later complications, such as cerebral abscesses, are relatively rare, and serious sequelæ, as insanity and epilepsy, are as yet much less common than has been foretold. It must be remembered, however, that a large percentage of the 610 cases examined have been seen or heard of only within some months of the wound, and in only 15 per cent. could the condition after more than one year be determined. There are no grounds for believing more radical operations abroad are called for. It seems extremely doubtful if surgical intervention, other than that necessary for the drainage and healing of the wounds, diminishes appreciably the risk of later complications, or can modify, except in a harmful direction, the course of these cases from the functional standpoint. Every possible step should, however, be taken to prevent the development of a hernia cerebri. Patients with foreign bodies lodged deeply in the brain recover, and are scarcely more liable to serious complications than men in whom the brain has been merely exposed and lacerated. Any attempt to remove them, which may involve spread of infection or further destruction of brain tissue, is consequently inadvisable. Of these 610 cases, in only 19 were the wounds still open three months after their arrival in England; 52 were again submitted to operation in England; and 22 died. (*Cf. Review*, 1916, xiv., p. 8.)

A. NINIAN BRUCE.

CONTINUED PARTIAL EPILEPSY OF TRAUMATIC ORIGIN.
(544) **(Epilepsie partielle continue d'origine traumatique.)** AUG. POLLOSSON and F. J. COLLET, *Rev. Neurol.*, 1915, xxii., May and June, p. 291.

THE case of a sergeant who was wounded by a bullet grazing the cranial vault. Immediately, without loss of consciousness,

awkwardness of the left hand developed, so that he became unable to dress himself. Two or three hours later abnormal movements were noticed in the left hand. On examination there was found to be a wound of the scalp over the right parietal region, but the skull was not fractured. The left wrist showed four or five flexor and extensor movements per second, which persisted during sleep. There was no voluntary movement in the fingers or thumb of the left hand, or at the left wrist.

The skull was trephined, and an extra-dural hæmatoma was found. The operation has been followed by recovery.

D. K. HENDERSON.

(545) **VISUAL DISTURBANCES DUE TO LESIONS OF THE INTRACEREBRAL OPTIC TRACTS AND OF THE CORTICAL VISUAL AREA. (Les troubles visuel dus aux lésions des voies optiques intracérébrales et de la sphère visuelle corticale.)** PIERRE MARIE and CHARLES CHATELIN, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 882.

THIS is a study of gunshot wounds affecting the visual cortex and its immediate nerve fibre connections. The visual field was measured, and an X-ray examination made of the occipital region in each case. Accounts are given of cases showing lateral homonymous hemianopia, hemianopia in the homonymous quadrant, or showing scotomata, either purely macular, hemianoptic, or multiple. The deductions are made that the cortical centre of vision is confined to the calcarine fissure and adjacent cortex, that the superior quadrant of one retina is projected on to the superior tip of the opposite calcarine fissure, and that a partial lesion of the visual cortex of one side produces a hemianoptic scotoma in each half of the visual field of the opposite side. The data are held to favour the view that the macula is projected on to the most posterior part of the calcarine fissure. Evidence for the existence of a special cortical centre for colour vision is considered to be lacking.

In more than half of the cases these examinations have demonstrated the presence of an unsuspected intracerebral foreign body. If a hemianoptic scotoma be determined, this furnishes in the case a valuable means of localising early intracerebral suppuration: a rapid increase of this scotoma makes one consider the possibility of an abscess, and surgical interference is warranted. Except for this contingency, surgical intervention is considered to be likely to do more harm than good.

H. W. HILLS.

ON A CASE OF FULMINATING DEATH IN THE COURSE OF
(546) **A LATENT ABSCESS OF THE BRAIN.** (Sur un cas de mort foudroyante au cours d'un abcès latent du cerveau.) A. ESPENEL and J. HAOUR, *Lyon méd.*, 1916, cxxv., p. 423.

A CASE of encysted cerebral abscess bulging into the cavity of the right lateral ventricle in a soldier, following a wound of the temporal region. The disease ran an insidious course for more than a year without giving rise to any other symptoms but very intermittent headache, until suddenly the cyst burst into the ventricle, thus explaining the sudden occurrence of coma and death with a temperature of 105° Fahr. J. D. ROLLESTON.

ON OTOGENIC CEREBRAL ABSCESSES. (Considérations cliniques
(547) **sur les abcès du cerveau otogènes.**) GOT, *Rev. de lar.*, 1916, i., p. 209.

A RECORD of three cases of temporo-sphenoidal abscess in soldiers successfully treated by opening and draining, and one fatal case of abscess of the cerebellum. Two were examples of the latent type, and one of the meningeal type of cerebral abscess, while the fatal case was an example of the cerebral type.

J. D. ROLLESTON.

APHASIA WITH LEFT HEMIPLEGIA FROM LIGATURE OF
(548) **THE RIGHT COMMON CAROTID.** (Aphasie avec hémiplégie gauche par ligature de la carotide primitive droite.) J. FERRAND, *Paris méd.*, 1916, i., p. 537.

A SOLDIER, aged 21, had his right common carotid partially severed by a bullet, which served, however, to plug the wound partially till the ligature was applied. He remained in a comatose state for two days after the operation, and then left hemiplegia and complete aphasia were observed. Ferrand regards the aphasia as an intellectual defect rather than as a real disturbance of language, and attributes it to an extensive lesion of the right cerebral hemisphere. J. D. ROLLESTON.

A SERIES OF CASES OF CEREBRAL EMBOLISM CONSEQUENT
(549) **ON THE RECEPTION OF GUNSHOT INJURY TO THE CAROTID ARTERIES.** Sir G. H. MAKINS, *Lancet*, 1916, cxci., Sept. 23, p. 543.

THIS is a paper dealing with a series of injuries to the great vessels of the neck, and it illustrates the serious effects of embolic obstruction of even the smaller cerebral vessels. The fourteen cases

dealt with are of practical interest, both from the complicated nature of the symptoms met with, and also from the unfavourable prognosis.

Cerebral embolism may result from either a perforating or non-perforating lesion of the vessels. A limited injury is considered the more serious source of danger. The length of time which the symptoms took to develop varied considerably. In one case they were said to be immediate, while in another four days elapsed before their onset. In five of the fourteen cases, damage to the sympathetic nerves was found, and this resulted in narrowing of the pupil, sinking of the eyeball, with narrowing of the palpebral fissure, and interference with the function of the sweat glands. A detailed report of the position of the wounds and of the symptoms in all the cases is given.

As regards prognosis, one patient died, one practically recovered from an incomplete right brachial monoplegia and aphasia, while slight improvement occurred in some of the others. It is stated that the general impression formed is an unfavourable one.

R. Dods Brown.

SPINAL CORD, &c.

GUNSHOT WOUNDS OF THE SPINE: THEIR SURGICAL ASPECT.

(550) Donald Armour, *Lancet*, 1916, April 8, p. 770.

The chief interest of such wounds lies in the commonly associated injury to the spinal cord and nerve roots. They may therefore be divided clinically into two main classes:—

1. Those in which the functions of the spinal cord are not interfered with.

2. Those in which there is interference with the functions of the spinal cord, with or without obvious injury to the vertebral column. In most cases this damage is immediate, but may be delayed if due to inflammatory thickenings of the meninges, formation of serous cyst of the meninges, excess or misplaced callus, intra- or extra-dural blood clot, or continued suppuration.

If the cord injury be immediate it may be caused by:—

(1) The missile passing through the spinal canal, wholly or partially dividing the cord.

(2) Fractured portions of bone driven in against the cord, causing compression, contusion, laceration, or complete division. This is the most frequent cause of the cord injury.

(3) Concussion, setting up structural changes in the cord due to the jarring or commotion effects of the blow. The cord may show no external signs of injury either to inspection or palpation.

X-rays are most unreliable in gunshot wounds of the spine, and may not reveal any bony injury even when present. Stereoscopic plates are necessary.

Operation is contra-indicated if there is a general septic condition arising from the state of the kidneys or bladder, with rigors and high temperature. An operation may be expected to relieve pressure, or at least remove doubt that continued pressure exists. It is thus indicated:—

(1) To relieve pressure from depressed or displaced fragments of bone.
(2) To relieve pressure from blood clot or hæmorrhage.
(3) To relieve pressure, and prevent further destruction from œdema by enlarging the constricted bony canal.
(4) To remove future danger of pressure from exudate and inflammatory thickening.

Unless the condition points to the fact that the symptoms are due to a complete transverse section or pure concussion, operation should be urged in order to place the cord under the most favourable conditions for recovery of function. A. NINIAN BRUCE.

NERVES.

THE CLINICAL INDIVIDUALITY OF THE PERIPHERAL
(551) **NERVES. (L'individualité clinique des nerfs périphériques.)** PIERRE MARIE and Mme. ATHANASSIO-BÉNISTY, *Rev. Neurol.*, 1915, xxii., May and June, p. 280.

IN a large series of cases of injuries to the nerves caused in the War the various nerves have been observed to behave differently. Lesions of the radial nerve show principally motor paralysis, lesions of the ulnar are characterised by pains, and those of the median by painful vasomotor and trophic disturbances.

A particular type of painful median neuritis is described as an intense, scorching pain exasperated by heat, and aggravated by pressure on the course of the nerve at the thenar eminence and at the base of the interdigital spaces. Just such a condition has never been observed in connection with the radial nerve.

It is the extensors of the fingers which are specially affected in paralysis of the radial, the flexors of fingers in median paralysis, and the interossei in ulnar paralysis.

The differences in the reflexes, in the electrical reactions, and in the objective sensory disturbances are also compared in the individual nerves.

The clinical individuality of the arm nerves specially manifests itself in the vasomotor disorders. These hardly ever occur with radial or ulnar lesions, but on the contrary they are constant in median nerve lesions.

In those cases where the vasomotor and trophic changes are marked, associated vascular lesions are also frequent.

In addition to the nerves of the arm, the sciatic nerve has also been studied, and it is shown that lesions of the nerve trunk give rise principally to painful phenomena, as is the case with the median. Vasomotor troubles predominate when the internal popliteal branch is hit, and objective sensory disorders when the external popliteal branch is hit.

Useful tables showing the reactions of the individual nerves are given. D. K. HENDERSON.

NERVE LESIONS BY WOUNDS OF WAR. (Sur les lésions des (552) **nerfs par blessures de guerre.)** J. BABINSKI, *Rev. Neurol.*, 1915, **xxii., May and June, p. 274.**

A RATHER general paper which, in the first place, discusses the difficulties of differentiating nerve lesions from lesions produced by section of tendons and muscles. Cases with organic nerve injury, but associated with a functional element, are also instanced. The author feels that this functional element is largely contributed to while the patients are in ambulances by medical men not sufficiently in touch with nervous pathology.

Incomplete section of nerves by bullets is very much more common than complete section.

In wounds of the axilla two groups of nerve injury have been seen, one characterised by a paralysis of the muscles supplied by the circumflex, musculo-cutaneous, and radial nerves, while the ulnar and median nerves remain intact, and vice versa. Frequently vasomotor and trophic changes are caused; the temperature of the affected side in many cases is different from the healthy, and there may be hypothermia, or hyperthermia, or both, in different parts of the affected limb.

In cases of contusion and compression a much more rapid amelioration of symptoms takes place under electrical treatment than was previously believed possible.

Surgical treatment by suture, or by freeing the nerve, is necessary in the great majority of cases, and above all in those suffering from severe pain. D. K. HENDERSON.

INJURIES TO THE PERIPHERAL NERVES PRODUCED BY
(553) **MODERN WARFARE.** C. BURNS CRAIG, *Amer. Journ. Med. Sci.*, 1916, clii., Sept., p. 368.

LACERATION and contusion may be differentiated usually by careful neurological examination. In some cases exposure of the nerve at the site of the injury is the only means by which exact knowledge of the nature of the injury to the nerve is obtained. Neither test of function nor electrical reaction will differentiate contusion from laceration. Cases of simple contusion recover slowly, and, as a rule, completely. Gunshot and shell wounds causing lacerations of the nerves do not lend themselves readily to plastic operations. Because of the injection weeks and months elapse before plastic work can be undertaken. During ten months no recovery in such cases was observed.

A. NINIAN BRUCE.

THE EXTENT AND NATURE OF THE SENSORY LOSS IN
(554) **MUSCULOSPIRAL PARESIS.** J. RENFREW WHITE, *Journ. Roy. Army Med. Corps*, 1916, xxvii., Sept., pp. 340-353.

SIX cases of injury to this nerve are described. The following are the conclusions arrived at:—

In no case of pure musculospiral paresis is there any loss of deep sensibility.

Complete uncomplicated division of the musculospiral nerve in its lower third results in most cases in no loss of cutaneous sensation.

Complete division of the musculospiral nerve in its lower third, complicated by simultaneous division of the posterior branch of the musculo-cutaneous, or the external branches of the musculospiral, produces an area of sensory loss on the back of the hand.

Complete uncomplicated division of the musculospiral nerve above its lower third—above the point of origin of the external cutaneous branches—results in an area of sensory loss on the back of the hand, but in some cases in addition, without any simultaneous musculo-cutaneous injury, there may occur an area of sensory loss on the back of the forearm.

The area of sensory loss on the dorsum of the hand involves areas both of epicritic and protopathic loss, and it varies in extent in different cases. The area of protopathic loss may overlap and extend beyond the area of epicritic loss, whereas it has always been held that in cases of injury to peripheral nerves, the former area is included within the latter. Where there is an area of sensory loss on the back of the forearm, it varies greatly in dimensions in different cases.

A. NINIAN BRUCE.

A CASE OF ERB-DUCHENNE PARALYSIS DUE TO A BULLET
(555) **WOUND OF THE FIFTH CERVICAL NERVE. Spinal accessory anastomosis: recovery.** GEORGE L. PRESTON, *Lancet*, 1916, cxc., June 17, p. 1215.

A SOLDIER was shot in the right side of the neck while trench-digging. Immediate paralysis of the right arm resulted, followed by wasting. Sensation was normal. A diagnosis of a lesion of the fifth cervical nerve was made, and as massage, &c., produced no improvement, operation was decided upon.

It was then found that the distal part of the fifth cervical nerve was completely separated from the proximal portion, and the communicating branch between the fourth and fifth nerves divided. Owing to scar tissue the two ends were one inch apart, and as end-to-end suture was thus impossible, an anastomosis of the distal part of the fifth cervical nerve with the spinal accessory was performed. Although this is a small path for the functions of the fifth cervical nerve, rapid recovery took place, good flexion of the forearm, and abduction of the whole arm to a right angle against resistance, resulting in about seven months.

A. NINIAN BRUCE.

NEUROSES, "SHELL SHOCK," &c.

THE PSYCHOLOGY OF MALINGERING AND FUNCTIONAL
(556) **NEUROSES IN PEACE AND WAR.** THOMAS LUMSDEN, *Lancet*, 1916, cxci., p. 860.

HYSTERIA is to be regarded as a disorder of the subconscious phase of the personality, in which suppressed desires and emotions manifest themselves vicariously by symptoms referable to any or all of the cerebral activities, motor, sensory, vasomotor, or sympathetic. In hysteria the highest conscious centres and cells lose their control over the lower cerebral centres, which then act under the direction of the subconscious and emotional areas. The motives, being denied outlet in their normal direct course, find expression in some perverted and abnormal direction.

Neurasthenia is the state which results when the brain cells are deficient in "ergogen." The patient is bankrupt as far as energy goes, yet hypersensitive of afferent impulses reaching the brain. Rest and nourishment restore the balance of ergogen, and so cure the condition. A vicious cycle of weakness and worry is common.

Malingering connotes the fraudulent feigning of symptoms or signs of disease selfishly for gain, and is a disease of the highest conscious cerebral centres in the frontal lobes.

"Traumatic neurasthenia" and "shell shock" are merely the late result of disordered emotions following an emotional shock, and are hysterical, or mixtures of hysteria and malingering.

A. NINIAN BRUCE.

A CONTRIBUTION TO THE ETIOLOGY OF SHELL SHOCK.

(557) HAROLD WILTSHIRE, *Lancet*, 1916, cxc., June 17, p. 1207.

THE wounded are practically immune from shell shock, presumably because a wound neutralises the action of the psychic causes of shell shock. Exposure and hardship do not predispose to shell shock in troops who are well fed. While it is theoretically possible that physical concussion resulting from a shell explosion might cause shell shock, it is certain that this must be regarded as an extremely rare and unusual cause. Chemical intoxication by gases generated in shell explosions cannot be more than a very exceptional cause of shell shock.

Gradual psychic exhaustion from continual fear is an important disposing cause of shell shock, particularly in men of neuropathic predisposition. In such subjects it may suffice to cause shell shock *per se*. In the vast majority of cases of shell shock the exciting cause is some special psychic shock. Horrible sights are the most frequent and potent factor in the production of this shock. Losses and the fright of being buried are also important in this respect. Sounds are comparatively unimportant. A consideration of the causes and frequency of relapses favours an original cause of psychic nature.

Any psychic shock or strain may cause a functional neurosis, provided it be of sufficient intensity relative to the nerve resistance of the individual. Such shock or strain need not have any connection with "sex complexes."

A. NINIAN BRUCE.

SHELL SHOCK AND ITS TREATMENT BY CEREBRO-SPINAL GALVANISM.

(558) WILFRID GARTON, *Brit. Med. Journ.*, 1916, Oct. 28, p. 584.

CEREBRO-SPINAL galvanism is only of use in the treatment of shell shock of the neurasthenic type, in which most of the following symptoms are found: headache (aggravated by thundery weather), insomnia, mental depression, loss of memory, nervousness, bad dreams, fatigue (without exertion), tremors, wasting, and loss of appetite. A possible explanation of the appearance and persistence of the symptoms is that the violent concussion of the explosion produces a partial paralysis of the nervi nervorum.

Four cases in soldiers are described. A pad, composed of

about sixteen layers of lint soaked in a solution of sodium salicylate, is applied to the forehead and connected with the negative pole, while the second pad is firmly bandaged to the lumbar region and connected to the positive pole. The current is increased slowly for about twenty minutes up to 20 milliampères, at which point it is allowed to remain for another twenty minutes.

A. NINIAN BRUCE.

SOME NEUROSES OF THE WAR. J. MICHELL CLARKE, *Bristol Med.-Chirurg. Journ.*, 1916, xxxiv., July, p. 49.
(559)

A GENERAL paper describing briefly a number of functional conditions. Cases of conscious simulation of nervous disorders were found to be rare. Disorder of voluntary movement in many cases is due to a disturbance of the reciprocal innervation through the final common path so that the agonists and antagonists are strongly innervated together, the result being not the desired movement, but a spasm of the limb in the position of the strongest set of muscles. This may be referred to an over-action of the cerebellum, or to the want of counteraction of the cerebellum owing to impulses from the cerebrum being in abeyance.

A. NINIAN BRUCE.

THE PSYCHO-PATHOLOGY OF THE WAR NEUROSES. (An Address delivered at the Malta Medical Conference on 9th April 1916.) M. D. EDER, *Lancet*, 1916, Aug. 12, p. 264.
(560)

THE psycho-neuroses among soldiers are capable of being understood in psychological terms. The symptom is a symbolic (disguised) expression of an unconscious mental process. The mental process *may be* the resultant of a conflict between two divergent impulses—the egocentric and the soldier's instinct. Morbid fright is due to pent-up emotions—stored-up fears—that have not been acknowledged or actually worked off.

A number of cases are described illustrating these points, *e.g.*, a soldier, aged 23, was admitted to hospital with a hysterical contracture of the right hand. The whole of the right upper limb showed anæsthesia up to the shoulder, although at the beginning of the examination he felt pin-pricks at the wrist. As the examination continued the anæsthesia gradually spread up to the shoulder. The contracture was similar to that of grasping the rifle, and symbolised that he was still fighting. The anæsthesia was also present during the fight; had he allowed himself to consciously feel pain he would either have had to retire or let go his rifle.

Another case with a stiff and painful back and paraplegia was attributed to a symbolic conversion of the fact that "the doctor put his back up" by too little attention to his original complaint.

A case of unilateral functional amblyopia in a sniper who had been located by the enemy was explained as a subconscious mechanism allowing him to leave his post without loss of self-respect.

Other cases are described illustrating fear and its disposal, maladaptation, and the effects of hypnosis which "works satisfactorily among soldiers." A. NINIAN BRUCE.

A SERIES OF MILITARY CASES TREATED BY HYPNOTIC
(561) **SUGGESTION.** J. BENNETT TOMBLESON, *Journ. Roy. Army Med. Corps*, 1916, xxvi., May; *Lancet*, 1916, cxci., Oct. 21, p. 707.

IN the first paper the results of twenty cases treated by hypnotic suggestion are recorded, and in the second sixty additional cases are described. The results are declared to be all most satisfactory, complete cure (for the time being at all events) being attained.

A. NINIAN BRUCE.

NERVOUS SYMPTOMS CAUSED BY THE BURSTING OF EX-
(562) **PLOSIVES. (Les accidents nerveux déterminés par la déflagration des explosifs.)** G. ROUSSY and J. BOISSEAU, *Paris méd.*, 1916, vi., p. 185.

THE writers describe three classes of patients:—

1. Those presenting mental disturbances (confusion, delirium, amnesia, &c.).
2. Those presenting nervous troubles (astasia-abasia, tremor, paralysis, contracture, &c.).
3. Those with symptoms of an intermediate character, assuming sometimes the type of confusion with stupor, and sometimes that of hysterical deaf-mutism.

The action of explosives at a distance produces only exceptionally such lesions as softening or hæmorrhage in the brain, cord or meninges. In the immense majority of cases the nervous troubles are of a functional or inorganic character, and should be classed in the group of hysterical or pithiatic symptoms. All may be cured immediately by appropriate psychotherapy.

J. D. ROLLESTON.

COMMOTION OF THE NERVE CENTRES BY A VIOLENT
(563) **EXPLOSION CLOSE AT HAND. INFLUENCE OF PHYSICAL PAIN ON THE PSYCHICAL STATE. (Commozione dei centri nervosi da explosione violenta a breve distanza. Influenza del dolore fisico sullo stato psichico.)** C. PASTINE, *Riv. di patol. nerv. e ment.*, 1916, xxi., p. 433.

As a result of a bomb exploding close to him an officer presented the following clinical picture:—On the organic side there were symptoms of a lesion—probably a meningeal hæmorrhage—localised to a cerebral region, endocranial hypertension, slight unilateral changes in the pyramidal tract, some indication of cerebellar asynergy, vertebral pain, deafness, and diminution of vision. On the psychical side there were marked slowing of all the intellectual faculties, depression, and amnesia. Removal of cerebro-spinal fluid produced a slight improvement; the second puncture, which was very painful, was a "dry tap," but produced a sudden and almost complete cure. Pastine excludes simulation and hysteria, and attributes the cure to the acute and violent physical pain of the lumbar puncture. J. D. ROLLESTON.

ORGANIC PYRAMIDAL LESIONS, FOLLOWING THE EXPLOSION
(564) **OF A PROJECTILE, WITHOUT AN EXTERNAL WOUND. (Troubles pyramidaux organiques consécutifs à l'éclatement d'un projectile sans plaie extérieure.)** G. GUILLAIN and J. A. BARRÉ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 834.

GUILLAIN had previously seen numerous cases of nervous disturbance of an undoubtedly organic nature following the explosions of bombs, air-torpedoes, *minenwerfer*, &c., without an external wound, and has recorded cases of epileptic attacks, paraplegia, hemiplegia, mental disturbance with bulbar symptoms, a cerebellar syndrome of the type of disseminated sclerosis, tremors, and choreiform states due to this cause.

The present case is that of a soldier who lost consciousness after explosion of a bomb, and then developed nervous symptoms characterised by headache, asthenia, vertigo, and changes in the reflexes. The pyramidal signs were bilateral ankle clonus and extensor response. In a month's time the symptoms disappeared and the plantar reflex became normal on one side, and it seemed probable, from what had occurred in similar cases, that all the other reflexes would become normal also. Soldiers who have been examined several months after the trauma on account of asthenia, difficulty in long marches, tremor, &c., are often regarded as cases

of hysteria. Such a view is open to criticism, because one is not justified in concluding that organic signs did not exist at the onset from the fact that they are no longer present.

J. D. ROLLESTON.

NOTE ON THE RELATION OF TREMORS AND EMOTIONAL
(565) **STATES. (Note sur la relation des tremblements et des états émotionels.)** GILBERT BALLET, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 934.

THIS observer holds that tremors may be unassociated with a primitive emotion, though so associated when they first began. In recent cases it is of no use to convince the patient that he must stop trembling; one should impress on him that there is no reason to be afraid, and this is better done by comforting reassurance than by harsh remarks. Where affect has ceased to accompany the tremors this therapy is useless.

H. W. HILLS.

TREMORS FOLLOWING EXPLOSIONS. (Les tremblements con-
(566) **sécutifs aux explosions.)** HENRY MEIGE, *Rev. Neurol.*, 1916, Feb., p. 201.

A DETAILED study of a case showing generalised tremors for more than a year after concussion by the explosion of an aerial torpedo. Emphasis is laid on the necessity of determining whether the constitution is naturally emotional, whether exaggerated reflexes, tachycardia, sudden rises of blood pressure or secretory activity are present in addition to the tremors. The constancy of tremors shows that they are not due entirely to the original emotional shock, but their dependence on the latter is evident from their exaggeration under emotional conditions of a similar nature. When search is made for intention tremors it is necessary to remember that fear of not performing the action required correctly may cause tremors. Old standing tremors probably have an organic basis, perhaps a lesion of the central grey matter of the brain.

Of course one must be satisfied that malingering and intentional exaggerations are absent. H. W. HILLS.

NERVOUS AND MENTAL DISEASES AND WAR. (Les maladies
(567) **mentales et nerveuses et la guerre.)** R. BENON, *Rev. Neurol.*, 1916, Feb., p. 210.

WAR may be, with its overwork and dangers, (*a*) the sole factor or (*b*) associated with a physical trauma in the causation of nervous and mental diseases. In the former case the nervous energy, emotivity, ideation, or motor functions of the brain may be specially affected, and cases are classified under these headings. In the latter case most diverse states may be produced: functional motor phenomena come in for special mention, and attention is drawn to the ease with which they clear up, and their liability to recurrence.

Of interest are the medico-legal deductions drawn from the experience of this war. The author is of opinion that every man showing neuropathic or psychopathic taint should be discharged from the army. Mental or nervous trouble dating from before the war is rarely exaggerated by it, so the question of compensation here hardly arises. Clinically, neurological and mental cases cannot be sharply separated, as mixed conditions are very frequent. By its fatigues and dangers war may sometimes be a contributory, sometimes a determining cause of nervous and mental troubles. Physical signs must be carefully sought for before a decision is given that a malady is psychical or functional in nature. Nervous and mental cases are just as deserving of compensation as those in which disablement follows a physical lesion. Predisposition in nervous and mental disease plays a smaller rôle than is commonly supposed. Each case requires special study, and when no trouble can be traced to the period before the war, the man should receive compensation. This should be awarded when improvement does not follow treatment of at the most six months' duration. Malingering of nervous and mental diseases is rather rare in war time, though exaggeration of functional motor trouble is common enough. Incipient dementia præcox is often taken for malingering, and often prolonged and minute observations are required before it can be excluded. The author considers it a bad practice to place all psychopathic cases in asylums, since they often clear up in a few weeks. He recommends that every general hospital should have a block reserved for cases of this nature.

H. W. HILLS.

CAMPTOCORMIE. (La camptocormie.) SOUQUES and ROSANOFF-
(568) SALOFF, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 937.

THESE authors consider that kyphosis is a defence against pain. It differs from physiological flexion of the trunk only in the

extension of the head, and this is determined by the need to look ahead when walking. H. W. HILLS.

ON CERTAIN ATTITUDES OBSERVED IN "WOUNDED
(569) **NEUROTICS." (De certaines boiteries observées chez les "blessés nerveux.")** HENRY MEIGE, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 939.

AN investigation of cases of limping or inability to stand erect where the organic lesion of trunk or lower limb appeared insufficient to cause the defect. Patients instinctively adopt an attitude which minimises the pain while the lesion is active, and many of them maintain the attitude after healing has taken place. Some do this for fear of evoking pain, and abandon the attitude when their fears are shown to be groundless. Others show only a partial response, inertia, or even opposition to persuasion, and strict discipline with graduated exercises are necessary in treatment. Others again are psychopaths who are obsessed with the idea of their disability long after there is adequate basis for it, and they act thus without malice aforethought.

To make a diagnosis, resort should be made to all methods of examination possible without forgetting the observation of patients in their daily routine. H. W. HILLS.

MENINGITIS.

CARDIO-VASCULAR AND MENTAL COMPLICATIONS IN THE
(570) **CEREBRO-SPINAL MENINGITIS OF THE ADULT. (Contribution à l'étude des complications cardio-vasculaires et mentales dans la méningite cérébro-spinale de l'adulte.)** V. MAIXANDEAU, *Thèses de Paris*, 1915-16, No. 129.

CEREBRO-SPINAL meningitis is far from rare in adult life, especially among mobilised men, in whom the mortality is unusually high. Cardiac troubles are especially frequent, and are due either to the meningococcus or its toxins.

Mental disturbance may precede or follow the meningeal symptoms. They were especially frequent in the author's cases, mobilised men aged from 35 to 45, whose nerve centres were predisposed by prolonged anxiety, fatigue, shock, or alcoholism.

Nine illustrative cases are recorded. J. D. ROLLESTON.

MENINGOCOCCAL CEREBRO-SPINAL MENINGITIS. SEVERE
(571) **FORM WITH PROLONGED COURSE. PERSISTENT CHANGES IN THE CEREBRO-SPINAL FLUID AND DEAFNESS. RELAPSE ON SIXTY-THIRD DAY. RE-INJECTION OF SERUM AFTER AN INTERVAL OF FORTY-THREE DAYS WITHOUT SYMPTOMS OF ANAPHYLAXIS. DEATH EXPLAINED BY EXTENSION OF THE MENINGEAL LESIONS.** **(Méningite cérébro-spinale à méningocoques. Forme grave et à évolution prolongée. Modifications du liquide céphalo-rachidien et surdité persistantes. Rechute au soixante-troisième jour. Réinjections de sérum après une interruption de quarante trois jours sans phénomènes d'anaphylaxie. Mort expliquée par l'extension des lésions méningées.)** NOBÉCOURT and PEYRE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 508.

THE patient, a soldier, aged 29, between 14th January and 3rd February 1916, received a total of 330 c.c. of anti-meningococcic serum in fourteen injections. It was only at the end of a week, and after 190 c.c. of serum, that he began to show slight improvement, and it was only on the twentieth day, after 310 c.c. had been injected, that the cerebro-spinal fluid became clear. To prevent anaphylaxis at the time of the relapse a subcutaneous injection of 2 c.c. of serum was first given, and then an intraspinal injection of 2 c.c. was given very slowly, and at the rate of 1 c.c. per minute.

The lesions found post mortem account for the failure of the treatment. The spinal cord was surrounded throughout its length by a sheet of thick pus. There was an extensive layer of pus at the base of the brain in the bulbo-pontine and cerebellar regions, and the cerebral ventricles were filled with pus. Bacteriological examination showed that the causal micro-organism was the true meningococcus, and not a parameningococcus or pseudo-meningococcus. J. D. ROLLESTON.

CEREBELLAR HÆMORRHAGE AND ACUTE GRAVES' DISEASE
(572) **IN CEREBRO-SPINAL MENINGITIS. (Hémorragie cérébelleuse et syndrome basedowiforme aigu, au cours d'une méningite cérébro-spinale.)** P. SAINTON and P. ROULLIN, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 711.

A SOLDIER, aged 27, was admitted to hospital with the diagnosis of typhoid fever. It was only on the sixth day that meningeal symptoms developed. The following day, when he was being made to sit up for lumbar puncture, he was suddenly seized with convulsive movements and generalised tremors; the thyroid became four times its normal size, enormous exophthalmos with lateral nystagmus developed, and the pulse varied between 120 and 136

These symptoms persisted until death, which took place in coma. Lumbar puncture shortly before death gave issue to a turbid fluid containing meningococci. Post mortem, in addition to the ordinary findings of cerebro-spinal meningitis, a recent hæmorrhagic focus, the size of a small hen's egg, was found in the corpus dentatum on section of the cerebellum. The outer surface of the cerebellum showed no inflammation, and there were no lesions of the ear or mastoid. The thyroid was congested. The writers attribute the hæmorrhage to septic embolism, producing deep lesions in the wall of the artery.

Clinically the only cerebellar symptoms observed were the lateral nystagmus and convulsive movements.

J. D. ROLLESTON.

PURPURA FULMINANS. HYPERACUTE MENINGOCOCCAL
(573) **SEPTICÆMIA.** (**Purpura fulminans. Septicémie méningococcique suraiguë.**) LE PAPE and GUY-LAROCHE, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 888.

THE patient was a soldier, aged 21. Clinically the case was one of purpura fulminans without meningeal symptoms. Blood cultures showed meningococci. The cerebro-spinal fluid which escaped under slight hypertension was slightly turbid, but the opalescence was due not to a leucocytosis, but to an enormous quantity of micro-organisms, which proved to be meningococci. 30 c.c. of anti-meningococcal serum were given, but death took place three hours later, seventy-eight hours from the onset.

The writers refer to five similar cases collected by Portret (*v. Review*, 1913, xi., p. 37). J. D. ROLLESTON.

OBSERVATIONS ON THE TREATMENT OF CEREBRO-SPINAL
(574) **FEVER.** C. WORSTER-DROUGHT, *Brit. Med. Journ.*, 1916, ii., p. 689.

THE lines of treatment discussed are drainage, serum, and vaccine. Vaccines have been given in larger doses than usual—250 million organisms are injected at the time of the first dose of serum; the treatment is repeated every fourth day, the second dose being 500 million; subsequent doses are increased by 500 million up to a maximum of 2,500 million. When an autogenous vaccine is not available, a polyvalent vaccine is given. Cases in which the vaccine treatment was certainly beneficial were those which tended to run a somewhat long course. No ill effect referable to the vaccine has been observed. While serum rashes occurred in some cases, serum treatment was never found to cause true anaphylaxis. R. G. BANNERMAN.

NOTE ON THE TECHNIQUE OF SPHENOIDAL SINUS EXPLORA-
(575) **TION FOR MENINGOCOCCAL AND OTHER INFECTIONS.** P. WATSON-WILLIAMS, *Bristol Med.-Chirurg. Journ.*, 1916, xxxiv., July, pp. 21-39 (7 figs.).

It has been suggested that the sphenoidal sinuses and posterior ethmoidal cells are occasionally or frequently the source from which the meninges become infected, and may thus provide the breeding-ground from which a local infection spreads so as to develop into cerebro-spinal meningitis (*v. Review*, 1916, xiv., p. 38). An infection of these sinuses need not necessarily cause definite signs and symptoms. Exploration of the sphenoidal sinus is therefore advisable. It is hardly possible to pass a mop or cannula into the sinus without previously or subsequently contaminating it while passing through the narrow olfactory fissure, in which case the culture yielded may be misleading. Also if the orifice of the sinus is small, the cannula may so fill the ostium that neither air nor fluid can enter or escape and no contents can be withdrawn as there is no "bunghole." The author describes the method of passing a short silver Eustachian catheter, No. 1 size, through the natural ostium, as well as through the thin anterior wall. The latter is the method of choice. In both cases local anæsthesia is sufficient.

A. NINIAN BRUCE.

AN INVESTIGATION CONCERNING THE DISINFECTION OF
(576) **MENINGOCOCCUS CARRIERS.** M. H. GORDON and MARTIN FLACK, *Brit. Med. Journ.*, 1916, Nov. 18, p. 673.

EVERY case of cerebro-spinal fever is an instance of a carrier developing the disease. Prognosis with regard to the duration of their future period of carrying varies largely with the degree to which their naso-pharyngeal secretion is infected by the meningococcus. The majority of carriers whose naso-pharynx yields only a few colonies of the meningococcus clear up quickly. Such cases do well with the direct application of a 1 per cent. solution of chloramine, or by subjecting them to inhalation of a steam spray charged with zinc sulphate.

Carriers whose nasopharyngeal secretion yields a copious growth, or a practically pure culture of the meningococcus, are often far more difficult to cure. Zinc salts are often disappointing, but chloramine yields better results in such chronic carriers.

Improvement also results from the treatment of chronic nasal or post-nasal catarrh by the automatic steam spray.

A. NINIAN BRUCE.

BACTERIOLOGICAL ASPECTS OF THE MENINGOCOCCUS
(577) **CARRIER PROBLEM.** A. EASTWOOD, *Journ. of Hygiene*, 1916, xv., Sept., pp. 405-445.

IT has been definitely established that organisms indistinguishable from meningococci by microscopic, cultural, and fermentation tests occur in the naso-pharynx of some persons who, so far as is known, have not been in contact with cases of cerebro-spinal fever. The evidence is still incomplete, whether such a naso-pharyngeal strain should be regarded as capable of producing cerebro-spinal fever in a suitable soil. The balance of available evidence is on the side of "Yes." Further work is necessary before the establishment of criteria for the classification of different strains into hard-and-fast groups can be accepted.

A. NINIAN BRUCE.

IDENTIFICATION OF THE MENINGOCOCCUS IN THE NASO-
(578) **PHARYNX WITH SPECIAL REFERENCE TO SERO-LOGICAL REACTIONS.** FRED. GRIFFITH, *Journ. of Hygiene*, 1916, xv., Sept., pp. 446-463.

ALL strains of Gram-negative cocci, obtained from the naso-pharynx, identical microscopically, culturally and in fermentation tests with meningococci, must, in default of a specific test for virulence, and until the serological relationships have provided definite evidence to the contrary, be considered to be meningococci.

A. NINIAN BRUCE.

A STUDY OF MENINGOCOCCI OCCURRING IN THE SPINAL
(579) **FLUID AND OF SIMILAR ORGANISMS IN THE NASO-PHARYNX.** W. M. SCOTT, *Journ. of Hygiene*, 1916, xv., Sept., pp. 464-484.

THE maximum period during which meningococci may be isolated from the naso-pharynx of convalescents exceeds three months.

Meningococci were isolated from the naso-pharynx and proved identical with those isolated from the spinal fluid of the same patient in seven cases.

In two of these cases the type of meningococcus found in the naso-pharynx at first resembled exactly that found in the spinal canal of the same patient, and later was persistently replaced by a meningococcus differing markedly in serological reactions from the spinal strain.

Micro-organisms indistinguishable from meningococci by microscopical and cultural methods (including fermentation tests) were found in the naso-pharynx in 22 per cent. of 138 individuals, non-contacts, from an urban population (Lambeth out-patients).

With 63 per cent. of these organisms the serological tests confirmed their identity with or close relationship to meningococci; they agglutinated specifically with anti-meningococcus serum and exhibited a tendency to fall into the same serological groups as the spinal strains.

Their agglutinating properties were not, in general, so strongly marked with the sera used as those of the known pathogenic strains, but they showed definite absorption of the specific agglutinin. They appeared to differ from the majority of the spinal strains not in the quality but in the quantitative intensity of their specific affinities: some spinal strains, however, resembled them in this.

Thus, in 13·7 per cent. of the 138 non-contacts micro-organisms were found in the naso-pharynx indistinguishable by any test from strains of meningococci known to have caused meningitis: these are regarded by the writer as meningococci and the individuals harbouring them as meningococcus carriers.

A. NINIAN BRUCE.

A CONTRIBUTION TO THE ETIOLOGY OF EPIDEMIC CEREBRO-
(580) **SPINAL MENINGITIS.** M. F. H. GAMBLE, *Lancet*, 1916, cxci., Aug. 12, p. 277.

EPIDEMIC cerebro-spinal meningitis was unknown in Victoria, Australia, until 27th May 1915, when an outbreak originated in the military training camp at Seymour. The source of the outbreak was looked for amongst the soldiers, hundreds of whom suffered from gonorrhœa in active form. The camp was very verminous, and the hygiene bad.

The author concludes that there is an intimate etiological relationship between the gonococcus and epidemic cerebro-spinal meningitis, and that the pediculi corporis acted here as carriers. "It is my firm conviction that cerebro-spinal meningitis in epidemic form is a true gonorrhœal inflammation of the arachnoid membrane of the brain and spinal cord, set up by the bites of gonococcal-infected pediculi corporis." A. NINIAN BRUCE.

EPIDEMIC CEREBRO-SPINAL MENINGITIS: Its Bacteriology and
(581) **Pathology.** W. J. DENEHY, *Brit. Med. Journ.*, 1916, ii., p. 684.

THE laboratory findings from 360 cases of the epidemic in Victoria, Australia, over a period of eleven months are here described. Contrary to the experience of Douglas in early cases, the organisms are usually intracellular: in the early cases mononuclear cells are frequently as numerous as polynuclears: the potassium perman-

ganate test is found to be of value, especially as it was positive in some cases which showed no organisms, gave no globulin tests, and contained few or no cells; fifty-one of the cases showed this condition. Quantitatively, it was found that in severe cases the fluid was able to reduce seven to eleven times its volume of 1:1,000 permanganate solution. In 24 per cent. intracellular diplococci occurred alone; in 56 per cent. both intracellular and extracellular cocci were seen; extracellular diplococci alone occurred in only 2 per cent.; in the remaining 18 per cent. of cases no organism was observed; in the last-mentioned type organisms may be found after the fluid has been incubated. The statement that when the disease is becoming less severe, the organisms become extracellular, is not confirmed. In a few cases a fluid was met with which contained few or no cells, but which was opalescent with organisms.

In regard to culture, it is very important to get the incubation commenced as soon after withdrawal of the fluid as possible; the meningococcus does not grow at a temperature below 23°; the subjection of the meningococcus to room temperature, even for a brief period, is apparently a frequent cause of failure to obtain growth; successful cultures were obtained in 60-70 per cent. of cases on glucose agar (3 per cent.), and frequently used in the preparation of vaccines. In three cases blood cultures were obtained. Organisms were discovered in blood films in some cases.

The author is in agreement with Lundie that post mortem there is to be found evidence not only of meningitis, but also of panencephalitis, as evidenced by the general flabbiness of the brain, and by a damaged condition of the ventricular ependyma. It is considered that the cause of death was toxæmia in 69 per cent., and internal hydrocephalus in 16 per cent. of cases.

R. G. BANNERMAN.

(582) **CHANGES IN THE AGGLUTINABILITY, FERMENTATION REACTIONS, AND ABSORPTIVE CAPACITIES OF THE MENINGOCOCCUS DURING THE ACUTE ATTACK.** I. WALKER HALL and B. A. I. PETERS, *Journ. Roy. Army Med. Corps*, 1916, xxvii., Oct., pp. 399-421.

Two cases yielded meningococci which exhibited a change in their fermentation reactions after the seventh day.

Three cases showed a different agglutinating power for the first coccus isolated and for those subsequently recovered. This variation was manifested by the blood, and to a less degree by the cerebro-spinal fluid. The agglutination of stock type emulsions by

the self-same blood and cerebro-spinal fluid was lower and slighter. In one case it was not evident.

One case yielded (*a*) a meningococcus which, after the seventh day, failed to agglutinate with the type immune which had previously produced agglutination, although it absorbed agglutinin from it. It was, however, agglutinated by another group serum, and exhibited absorptive powers for its agglutinin contents: (*b*) blood and cerebro-spinal fluid which agglutinated one type of meningococcus up to the seventh day, and another type afterwards: (*c*) nasopharyngeal meningococci which retained type manifestations up to the time of their disappearance.

These changes corresponded with definite clinical signs of improvement or failure of response.

Intraspinal injections of eusol solution did not stay the disease, but were followed by a lessening of the gelatinous consistence of the exudate, an increase in its amount, a decrease in the number of meningococci with augmented phagocytosis, and a disappearance—sometimes complete—of the yellowness of the fluid withdrawn. A. NINIAN BRUCE.

AN EXPERIMENTAL STUDY OF THE CULTURAL REQUIRE-
(583) **MENTS OF THE MENINGOCOCCUS. Together with a description of an easily prepared medium for that micro-organism.** M. H. GORDON and T. G. M. HINE, with a note by MARTIN FLACK, *Brit. Med. Journ.*, 1916, Nov. 18, p. 678.

VARIOUS media have been investigated with a view to their suitability for obtaining and maintaining cultures of the meningococcus with more constancy than has hitherto been experienced. Experiments were made to ascertain what advantage was gained by the inclusion of certain constituents in the medium. As a result, a medium known as "trypagar" has been elaborated: its mode of preparation is described: it is an agar medium containing, essentially, trypsin broth and an extract of peaflour. Peaflour is found to contain an element which favours the growth of the organism in question: there is reason to consider it as belonging to that class of extractives called vitamines: in this case the vitamine concerned is one whose predominant effect is to favour the growth of the meningococcus: an extractive similarly obtained from wheat grain was found to have an effect rather on the vitality of the organism. For stock cultures, therefore, a medium is used which contains extracts both of peaflour and wheat germ.

R. G. BANNERMAN.

EPIDEMIC CEREBRO-SPINAL FEVER: the place of the meningo-
(584) **coccus in its etiology.** EDWARD C. HORT and ALFRED H. CAULFIELD, *Brit. Med. Journ.*, 1916, Oct. 14, p. 522 (fourth contribution); *Journ. Royal Army Med. Corps*, 1916, xxvii., Sept., pp. 312-339.

THE following conclusions were based on intraperitoneal and subcutaneous injection:—

1. The pathogenicity to monkeys of cerebro-spinal fluid from acute cases of cerebro-spinal fever appears to tend to vary inversely as its meningococcal content.

2. The cerebro-spinal fluid in this disease sometimes contains a filter-passing agent which is not the meningococcus, but which is nevertheless capable of producing in monkeys continued fever or death.

3. This filter-passing agent appears to be a living virus capable of cultivation in the laboratory, and of passage through monkeys.

4. None of the pathogenic results can be reasonably attributed to the action of living meningococci as such, or to the direct or indirect action of a meningococcal toxin.

5. The pathogenicity of cultures of the meningococcus appears to be due to the concomitant presence of the filter-passing virus described.

6. The pathogenic effects observed in the monkeys injected, whether with cultures of meningococci, with filtered or unfiltered cerebro-spinal fluid, or with cultures of the filter-passing virus referred to as "X," did not include gross pathological changes in the cerebro-spinal system. A. NINIAN BRUCE.

LIFE-HISTORY OF THE MENINGOCOCCUS AND OTHER
(585) **BACTERIA.** J. G. ADAMI, *Brit. Med. Journ.*, 1916, Oct. 14, p. 525.

THE *Bacillus typhosus* has well established itself as a pathogenic agent. There is the serum reaction; there is the fact that a vaccine will confer immunity; yet a living culture will not cause the disease: no one has produced the symptoms and specific lesions of enteric fever in man or animal by the employment of a stock culture of the typhoid bacillus.

Similarly with hog cholera, which causes in swine similar lesions to those of typhoid in man, cultures are to be constantly obtained of the *B. suipestifer*, and the blood serum of the affected animals agglutinates the bacillus; but inoculation of pure cultures of the bacillus will not reproduce the disease in pigs: what is more, the organism may be isolated from the stools of unaffected animals where the disease is rife. After the "long and honour-

able career" of the bacillus, Dorset, Bolton, and McBryde, in 1905, proved that the suggestion of de Schweinitz in 1903 was correct, and that hog cholera is set up by a filterable virus.

Similarly, Petrie and O'Brien describe an epizootic disease in guinea-pigs "complicated" by an organism indistinguishable from the *B. suipestifer*; nevertheless, they prove that the disease is caused by a "filter passer." To these examples are probably to be added distemper in dogs and scarlet fever in man, and also typhus fever.

Probably the work of Hort and Caulfield on cerebro-spinal fever is the beginning of a revolution in our conception of the life-history of pathogenic bacteria. It is certain that the meningococcus is intimately associated with the disease—meningococci are demonstrable in 99 per cent. of cases; the specific curative action of antimeningococcal serum is further evidence. Yet cultures of the meningococcus will not reproduce the disease. Flexner claimed to have done this, but Hort and Caulfield point out that enormous doses were used, and that cultures from the spinal fluid were only obtained after a relatively very short time.

Now, Hort and Caulfield show that cultures of meningococci are incapable of causing the disease; but that same fluid contains a filterable virus, which causes an infectious process when inoculated into monkeys, and they are able to cultivate this virus, obtaining, as did Rout and Nocard in the case of pleuro-pneumonia of cattle, a clouding of fluid media, and after a series of passages outside the body they have been able to inoculate monkeys, induce the characteristic prolonged fever, and from animals so inoculated have regained the filterable virus.

What is the meaning of this association of the meningococcus and filterable virus? Symbiosis has been suggested, it being supposed that the virus prepares the way for the bacterium. Hort suggests that the two are two phases in the life-history of one organism. Are we wrong in thinking that bacteria are only possessed of a sexual reproduction by fission? It may be shown that while, with all care, *B. tuberculosis* might not be demonstrable in sections from a caseous tubercle, yet inoculation of a guinea-pig with the caseous material will cause tuberculosis; there is no question of spores, as heat renders the material innocuous. As a matter of fact, small Gram-positive granules can be seen in caseous material, similar to Much's granules in Hodgkin's disease. In 1901 (?), Abbott, Nicholson, and Adami found in the liver in cases of hepatic cirrhosis minute granules, and in the bile diplococcoid bodies, which in culture gave rise to the *B. coli*.

R. G. BANNERMAN.

CALCIFIED CYST OF THE CEREBRAL EPENDYMA AND TUBER-
(586) **CULOUS MENINGITIS. (Kyste calcifié de l'ependyme cérébral et méningite tuberculeuse.)** P. SAINTON, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 1010.

A SOLDIER, aged 22, whose past history could not be obtained, suddenly fell ill with vomiting and headache, followed by complete paralysis of the right upper limb and choreiform movements of the left upper and both lower limbs. Death took place after about one week's illness. In addition to typical tuberculous meningitis, the autopsy showed a calcified nodule in the left lateral ventricle, close to the insertion of the choroid plexus. The nodule, which was composed of carbonate and phosphate of lime, represented the sequela of an attack of ependymal tuberculosis which had probably occurred many years previously. It was impossible to say whether the present attack was due to a fresh infection or to the renewed activity of an old focus of ependymitis.

J. D. ROLLESTON.

STATISTICS OF 243 SOLDIERS SUFFERING FROM MUMPS.
(587) **FREQUENCY OF ORCHITIS AND MENINGEAL REACTIONS. (Statistique portant sur 243 militaires atteints d'oreillons. Fréquence des orchites et des réactions méningées.)** E. DE MASSARY and TOCKMANN, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 1035.

CLINICAL evidence of a meningeal reaction was found in 56 cases, or 23 per cent. In 32 cases the meningeal reaction preceded, accompanied, or followed orchitis, which was noted in 59 cases, or 24 per cent. In all but one case, in which they appeared on the seventeenth day, the meningeal symptoms developed between the sixth and tenth days of mumps, and consisted in a sudden rise of temperature, severe headache, slow pulse, vomiting, nuchal rigidity, and Kernig's sign. Headache was relieved by lumbar puncture, which gave issue to a clear fluid under hypertension, and extremely rich in lymphocytes. The symptoms lasted, as a rule, two to five days. All recovered without any sequelæ. J. D. ROLLESTON.

TETANUS.

AN ANALYSIS OF CASES OF TETANUS TREATED IN HOME
(588) **MILITARY HOSPITALS FROM 1st AUGUST 1915 TO 31st JULY 1916.** Sir DAVID BRUCE, *Lancet*, 1916, cxci., pp. 929-932.

DURING this period reports of 195 cases were under review, and of these 99 recovered and 96 died, a mortality of 49·2 per cent. Cases with a short incubation were more fatal than those with

a longer incubation. The greatest number of cases occurred on the eleventh day after the wound. There are no allusions to the use of antitetanic serum as a prophylactic in home military hospitals. In regard to the therapeutic effect of antitetanic serum, the evidence as collected from the 1915-16 reports is not conclusive. In the cases under consideration, the advantage of the intrathecal route over the subcutaneous or other routes is also not conclusive. There is no evidence that any benefit accrued to the cases treated by carbolic acid or magnesium sulphate injections. With our present knowledge the treatment of a case of tetanus might be as follows:—

(*a*) Place in a quiet, darkened room, under the care of a sympathetic and capable nurse. "Rest, sleep, and food" are looked upon as the first essentials of treatment.

(*b*) If thorough surgical treatment is carried out on wounds from the beginning, so as not to allow the presence of necrotic tissues or foreign bodies, the number of cases of tetanus should sensibly diminish, if not altogether disappear. But if a case does occur, then the wound should not be actively interfered with until the tetanic symptoms have subsided.

(*c*) The intrathecal injection of large doses of antitoxin, of high potency if available, should be begun at once, and supplemented by intramuscular and subcutaneous injections.

(*d*) In addition, if necessary, the patient should receive sedatives, of which morphia in $\frac{1}{4}$-grain doses and administered every four hours, is perhaps the most suitable. Chloral, chloretone, and other sedatives are also given by the mouth or rectum.

A. NINIAN BRUCE.

PARTIAL TETANUS OF THE LIMBS WITH EARLY ONSET. (Les (589) **tétanos partiels des membres à début précoce.**) F. GIROD, *Thèses de Paris*, 1915-16, No. 67.

A RECORD of six cases from recent literature illustrating a condition in which tetanus develops less than twenty days after infection, and is localised to two symmetrical limbs or to a single one. According to the number of limbs affected, three principal clinical forms have been described:—

1. Monoplegic type (upper or lower).
2. Paraplegic type (upper or lower).
3. Monoplegic type with transient paraplegia.

The disease usually occurs in three stages:—(1) A period of onset characterised by pain in the wounded limb, the clonic or toxic movements lasting from a few hours to a few days. (2) The height of the disease, during which there may be a generalisation

of the movements, but of short duration and feeble intensity, the symptoms remaining predominant in the affected limb. (3) A period of remission preceding complete cure, or on the contrary, a fairly long period characterised by a permanent state of rigidity, in which musculo-tendinous contractures are observed which may be permanent.

The prognosis is fairly good. All the six cases related in the thesis recovered, five completely, and one with contracture. Treatment is the same as for ordinary tetanus.

J. D. ROLLESTON.

LATE LOCALISED TETANUS OF AN ABDOMINO-THORACIC TYPE. (Tétanos tardif localisé à type abdomino-thoracique.)
(590) P. L. MARIE, *Paris méd.*, 1916, ii., p. 49.

A SOLDIER, aged 31, received numerous shell wounds on 10th July, on the face, scalp, upper part of thorax, left arm, and left leg. Two days later he was given 10 c.c. of tetanus antitoxin, and on the 13th his left eye was enucleated. On 10th November, 130 days after he had been wounded, he developed intermittent lancinating pains in the abdomen and thorax, soon followed by persistent abdomino-lumbar muscular contracture. In spite of chloral his condition became worse, and on 20th November sudden jerkings occurred extending from the waist to the feet. On 3rd December respiratory trouble set in, probably due to extension of the contracture to the muscles innervated by the intercostal nerves. 110 c.c. of tetanus antitoxin were injected in three doses, and slow and progressive improvement took place. No previous examples of an abdomino-thoracic type of tetanus have been recorded.

J. D. ROLLESTON.

THE PRESENCE OF THE TETANUS BACILLUS ON THE SURFACE OF PROJECTILES ENCLOSED WITHIN CICATRISED WOUNDS. (Sur la présence du bacille du tétanos à la surface des projectiles inclus dans des plaies cicatrisées.)
(591) AUGUSTE LUMIÈRE, *Compt. Rend. Acad. des Sci.*, 1916, clxiii., Oct. 9, p. 378.

THE writer has seen many cases of delayed tetanus in the subjects of cicatrised wounds which contain non-extracted projectiles. In one case he found the tetanus bacillus on the surface of a projectile in a wounded patient, free from tetanus, in whom a fragment was removed thirty-eight days after the wound and fifteen days after its cicatrisation. Conclusions:—

(1) Projectiles enclosed in cicatrised wounds can carry with

them the spores of tetanus bacilli, which are dangerous to the subject: they should be extracted whenever accessible.

(2) Injections of anti-tetanic serum should be given at the time of every secondary extraction, even though the wound be cicatrised. LEONARD J. KIDD.

ABSENCE OF THE TETANUS TOXIN IN THE CEREBRO-SPINAL
(592) **FLUID OF THE SUBJECTS OF TETANUS. (Sur l'absence de toxine tétanique dans le liquide céphalo-rachidien, chez les sujets atteints de tétanos.)** FENESTRE and P. GÉRARD, *Compt. Rend. Soc. de Biol.*, 1916, lxxix., Oct. 21, p. 850.

ACCORDING to Bard and others, when some cubic centimetres of the cerebro-spinal fluid from cases of tetanus are injected intra-peritoneally into guinea-pigs, death from generalised tetanus follows after a period of incubation of uncertain duration; this method is held to be of diagnostic value whenever the tetanus bacillus cannot be isolated. The writers injected 2 c.c. of the cerebro-spinal fluid from three undoubted cases of tetanus into guinea-pigs; in each case the fluid was limpid, and contained the normal number of lymphocytes. The animals showed no signs of tetanus. The writers, therefore, disagree with Bard's teaching, and maintain that the cerebro-spinal fluid of the subjects of tetanus does not contain the tetanus toxin. LEONARD J. KIDD.

GENERAL.

ON THE PLANTAR REFLEX IN A CASE OF ACUTE ATAXIA:
(593) **DIFFERENT STATE OF THE REFLEX ACCORDING TO THE PATIENT'S POSITION. (Sur le réflexe cutané plantaire dans un cas d'ataxie aiguë; état différent de ce réflexe suivant la position du malade.)** G. GUILLAIN and A. BARRÉ, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 131.

IN the case of a soldier, suffering from acute ataxia, the plantar reflex examined in the ordinary dorsal position showed extension of the great toes and fan sign on both sides, while in the ventral position, with the legs flexed at right angles on the thighs, all the toes became flexed. J. D. ROLLESTON.

VARIATION IN THE TENDON REFLEXES AS THE SOLE OBJECTIVE CLINICAL SIGN OF A SEVERE ASTHENIC CONDITION; MARKED CHANGES IN THE CEREBRO-SPINAL FLUID. RAPIDLY FATAL TERMINATION BY ICTUS, WITH MENINGEAL SIGNS. PROBABLE SYPHILITIC ORIGIN. (Réflexes tendineux variables, seule manifestation clinique objective d'un état asthénique grave; altérations marquées du liquide céphalo-rachidien; terminaison mortelle rapide par ictus avec signes méningés. Origine syphilitique probable.) DUMOLARD, REBIERRE and QUELLIEN, *Paris méd.*, 1916, vi., p. 286.

(594)

THE patient was a soldier, aged 30, whose symptoms were those of the asthenia commonly seen after the fatigues of war. The only objective sign of nervous disturbance was found in the reflexes which were present at one time of the day, and absent at another. The cerebro-spinal fluid showed excess of albumin, lymphocytosis, and a positive Wassermann's reaction. Post mortem, an area of softening the size of a small egg was found in the region of the first right occipital convolution.

J. D. ROLLESTON.

GENERALISED DIPHTHERITIC PARALYSIS WITH MENINGEAL REACTION. (Paralysie diphtérique généralisée avec réaction méningée.) P. RAVAUT and G. KROLUNITSKY, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 913.

(595)

THE writers record a case closely resembling that recently described by Chauffard and Le Conte (*v. Review*, 1916, xiv., p. 76).

A soldier, aged 29, contracted a severe attack of diphtheria, the nature of which was not recognised at the time. In a few weeks he developed palatal palsy, and later generalised paralysis. Lumbar puncture showed marked increase of albumin and definite lymphocytosis. A second puncture, five days later, showed that the lymphocytosis had disappeared, but that the albumin had increased. The patient was then lost sight of.

J. D. ROLLESTON.

ACUTE RELAPSING ANTERIOR POLIOMYELITIS WITH RAPID COURSE. RECOVERY. (Poliomyélité antérieure aiguë récidivante à évolution rapide, suivie de guérison.) H. DUFOUR, *Bull. et mém. Soc. méd. Hôp. de Paris*, 1916, xl., p. 674.

(596)

A SOLDIER, aged 20, was admitted to hospital for paralysis which had come on two days previously. There was complete paralysis of all four limbs, which had started in the hands and thence spread to the upper and lower limbs. The sphincters and

facial muscles were intact. There was no cardiac nor respiratory disturbance, nor any sensory disorder. The reflexes were absent, except the ankle jerks. The cerebro-spinal fluid was clear, without lymphocytes and albumin, and gave a negative Wassermann reaction. The day following admission the patient was apparently cured. The paralysis had disappeared, the reflexes had returned, and the only sign left of the disease was Gordon's sign, shown by extension of the toes on stroking the calf muscles. On inquiry it was found that the patient had had a similar attack six weeks previously which had lasted three days, and then disappeared spontaneously. J. D. ROLLESTON.

HYSTERICAL CHOREA OF THE DIAPHRAGM. (Chorée du dia-
(597) **phragme d'origine hystérique.)** SIMONIN and CHAVIGNY, *Paris méd.*, 1916, vi., p. 191.

A RECORD of two cases in soldiers:—

Case 1.—The symptoms followed an attack of diaphragmatic pleurisy, and were associated with convulsive hysteria. The diaphragmatic jerkings numbered sixty a minute, the respiration was noisy, but there was no hiccough nor barking.

Case 2.—A man, aged 45, who had received violent kicks in the thorax twenty-seven months previously, had ever since been subject to intense dyspnœa without any physical signs. The respirations varied from sixty to eighty, and every four or five minutes were interrupted by a short, superficial, dry cough. On X-ray examination the two sides of the diaphragm presented small rapid movements, and instead of working symmetrically the two halves acted alternately like a pair of scales.

J. D. ROLLESTON.

THE INFLUENCE OF COFFEE AND VERONAL INTOXICATION
(598) **ON THE SPERMATOGENETIC FUNCTION OF NORMAL ANIMALS, AND OF ANIMALS SUBJECTED TO CEREBRAL COMMOTION. (L'influenza degli avvelenamenti da caffè e da veronal sulla funzione spermatogenetica di animali sottoposte a commozione cerebrale.)** L. DE LISI, *Riv. di patol. nerv. e ment.*, 1916, xxi., p. 401.

FROM experiments on cocks the writer came to the following conclusions:—Poisoning of slight intensity, and not excessively prolonged, with infusion of coffee, causes in about a month's time a slight macroscopical atrophy of the testes and enfeeblement of the spermatogenetic activity. The intoxication does not modify to a great extent the animal's state of nutrition. It gives rise

to nervous symptoms of a cerebral nature. The sexual instinct is diminished.

Veronal poisoning causes a marked macroscopical atrophy of the testes, an almost complete suspension of spermatogenesis, and grave degenerative processes of the spermatic canaliculi. The action of veronal is rapid. The cocks lose flesh rapidly.

The nervous disturbances are severe and complex, and have principally the characters of spinal cord lesions. The sexual instinct and secondary sexual characters disappear.

When the intoxication is preceded by slight and rapid cerebral commotion (blows on the head), and still more when the commotion is accompanied from the beginning with intoxication, macroscopic atrophy of the testes results, with profound changes in the structure and function of the testes.

J. D. ROLLESTON.

ON THE PSYCHICAL COMPLICATIONS OF PARATYPHOID.
(599) **(Sur les déterminations psychiques des paratyphoïdes.)** P. MERKLEN, *Paris méd.*, 1916, ii., p. 64.

A RECORD of four cases in soldiers suffering from paratyphoid A, to show that paratyphoid may give rise to the ordinary forms of acute toxi-infective psychoses. These complications hardly ever occur except in severe attacks, often at the onset of the disease. They gradually subside, leaving the disease to pursue its ordinary course, but sometimes persist well on into convalescence.

An individual predisposition is necessary for their development, as they indicate a constitutional mental inferiority which had hitherto been latent. J. D. ROLLESTON.

THROMBOSIS OF THE CEREBRAL ARTERIES IN PARA-
(600) **TYPHOID B.** WM. MACADAM, *Journ. Roy. Army Med. Corps*, 1916, xxvii., Oct., p. 499.

THIS paper has already been abstracted (*c. Review*, 1916, xiv., p., 235). A. NINIAN BRUCE.

MERALGIA PARÆSTHETICA. W. J. RUTHERFORD, *Brit. Med. Journ.*,
(601) 1916, Oct. 28, p. 583.

THIS condition is characterised by mononeuritis of the external cutaneous nerve of the thigh. As this is purely a sensory nerve, no motor disturbance is found. The chief feature is dissociated sensation, protopathic sensibility being unimpaired. In old-standing cases a distinct cutaneous thickening may be made out locally,

and the phenomenon of cutis anserina is also locally lost. Pain may be present as a mere tingling, or may be so severe as to incapacitate the patient for the time being. The attacks of pain tend to wear off, and to become less frequent with the lapse of time. The feature of the condition is the unreliability of the symptoms and the likelihood of relapse.

Five cases are described in soldiers. It is suggested that as posture seems to ease the pain during the paroxysms and exercise increase it, or even precipitate an attack, the condition is due to a nipping of the nerve trunk at its point of emergence through the fibres of the fascia lata. A. NINIAN BRUCE.

VENEREAL DISEASES DURING WAR. (Les maladies vénériennes
(602) **pendant la guerre à l'hôpital Villemin et dans ses annexes.)** GAUCHER, *Bull. de l'Acad. de méd.*, 1916, lxxv., p. 352, and *Ann. des mal. vénér.*, 1916, xi., p. 193.

IN Gaucher's service syphilis has increased by more than a third since the mobilisation, a fact which Gaucher attributes to neglect of sexual prudence and the moral relaxation inevitable in war time.

Gonorrhœa was especially frequent at the beginning of the war.

Soft chancre was comparatively infrequent, but Gaucher for the last fifteen years has been of opinion that soft chancre by itself is extremely rare, and in the majority of cases is associated with syphilis. J. D. ROLLESTON.

SOME CASES OF SYPHILIS OF THE EYE FOLLOWING TREAT-
(603) **MENT BY SALVARSAN.** S. H. MCKEE and H. D. COURTENAY, *Canadian Med. Assoc. Journ.*, 1916, vi., Nov., pp. 996-997.

THE cases of three soldiers are described who developed syphilitic lesions of different parts of the eye within six months of their first treatment for syphilis. A. NINIAN BRUCE.

A METHOD OF APPLYING THE WASSERMANN REACTION IN
(604) **LARGE NUMBERS.** P. FILDES and JAMES M'INTOSH, *Lancet*, 1916, cxci., Oct. 28, p. 751.

A SHORT description of the method introduced into the Royal Naval Hospital, Haslar. The chief characteristic is the use of a particular antigen composed of tissue extract mixed with cholesterin. About 0·5 c.c. of blood is required.

A. NINIAN BRUCE.

MODEL HYDROTHERAPEUTIC INSTALLATION FOR SOLDIERS, WITH GROUND PLAN. R. FORTESCUE FOX, *Journ. Roy. Army Med. Corps*, 1916, xxvi., May (1 plan).

(605)

A DESCRIPTION of an installation designed to provide the most necessary and valuable methods of hydrotherapeutics for wounded and invalid soldiers. It is arranged for a single hut (60 feet by 20 feet), and is designed to provide (*a*) general treatment—(1) tonic, and (2) sedative—and (*b*) local treatment for disabled limbs. A. NINIAN BRUCE.

PSYCHIATRY.

MENTAL DISEASE IN THE ARMY. CAN IMBECILES BE MADE USE OF? (Contribution à l'étude de maladies mentales dans l'armée. Peut-on utiliser les imbéciles?) J. M. H. A. LAUTIER, *Thèses de Paris*, 1915-16, No. 132.

(606)

IN peace time the army contains a certain number of imbeciles who carry out their duties more or less successfully. In war time they should be at once discharged, not only from active service but also from the auxiliary force, owing to their tendency to lay violent hands on their officers, their comrades, or themselves, their lack of discipline, and their mistakes in carrying out orders.

Ten illustrative cases are recorded. J. D. ROLLESTON.

Reviews

WOUNDS OF NERVES. (Les Blessures des Nerfs. Sémiologie des Lésions Nerveuses périphériques par Blessures de Guerre.) J. TINEL, Ancien Chef de clinique et de laboratoire de la Salpêtrière, Chef du Centre neurologique de la iv^e^ Region. Preface by Prof. Dejerine. Pp. xi+312, with 323 figs., almost all original. Masson et Cie, Paris. 1916. Pr. 12 fr. 50.

(607)

CLINICAL FORMS OF NERVE LESIONS. (Formes cliniques des Lésions des Nerfs.) Mme. ATHANASSIO-BENISTY, Interne des Hôpitaux de Paris (Salpêtrière). Preface by Prof. Pierre Marie. Pp. 240, with 81 original figs. in the text, and 7 plates, some coloured. *Collection Horizon. Précis de médecin et de chirurgie de guerre.* Masson et Cie, Paris. 1916. Pr. 4 fr.

(608)

THE number of cases of wounds to the peripheral nerves has been one of the medical surprises of the war. Tinel estimates them at not less than 18 to 20 per cent. Previous to the war such

injuries were comparatively rare, and our knowledge was correspondingly incomplete. Their study is also of special importance, because early diagnosis is essential to allow the gravity and importance of the injury to be recognised; failure to do so leads to a false prognosis, and may make the resulting paralysis either of long duration or incurable. The special works devoted to this subject up till now are mostly difficult of access.

The war has supplied the material for a minute study of such injuries, and has allowed us to understand the different kinds of lesions which may result, and the different kinds of symptoms which they may produce. It is only by a careful and minute study of the semiological value of partial and complete paralyses, of muscular hypotonias, of electrical reactions, of anæsthesias, paræsthesias and pains of various types, of vaso-motor, secretory and trophic changes, &c., that it is possible to trace each symptom to its determinant lesion. By a careful investigation of these troubles and of their evolution it has been possible to establish the syndromes of nervous interruption, compression, irritation, regeneration, &c. From microscopical examination we are able to discover the histological basis of these conditions and to find out the characteristics of neuromas and pseudo-neuromas, and how "vicious cicatrices" are formed (called by Dejerine *chéloïdes nerveuses*), which do not allow the passage of axis cylinders. We also now know what cases are suitable for operation and which should be left alone. We are also enabled to recognise cases of functional paralysis, whose cure is so easy if diagnosed early.

Both the above two books are excellent works to consult on this subject, and reflect great credit upon the French school.

The first is the larger and is based upon the personal study of 650 cases observed by the author, together with an analysis of all the neurological papers which have appeared before and during 1916. Of these injuries 409 were in the upper limb, and 219 in the lower. Each nerve is studied in detail, its anatomy and physiology is discussed, and the symptoms resulting from injury explained. A special feature is undoubtedly the wealth of illustrations, showing the wounds themselves, the symptoms, areas of anæsthesia, &c. No better book on this subject has yet appeared.

The second and smaller book deals only with the clinical forms of nerve lesions, mostly from the diagnostic point of view. The problems of treatment and repair will appear shortly in another volume. Special attention is paid to the varieties of painful types, the importance of vascular lesions associated with nervous lesions and the results of injuries to sympathetic fibres. Several very fine plates illustrate these conditions.

NERVE INJURIES AND THEIR TREATMENT. PURVES STEWART, M.A., M.D., F.R.C.P., and ARTHUR EVANS, M.S., M.D., F.R.C.S. Pp. xii+208, with 97 figs. Oxford Medical Publications. Henry Frowde and Hodder & Stoughton, London. 1916. Pr. 8s. 6d. net.

(609)

THIS book is largely the record of the authors' experience of a large number of cases of injuries to nerves seen by them since the outbreak of the war, and affecting most of the peripheral nerves. The greater number involved the upper limb, and of these, injuries to the brachial plexus were the most frequent. All these injuries are briefly discussed, the wound, symptoms, and diagnosis described, and in many cases illustrated by figures, the areas of anæsthesia marked out, and the condition present at operation recorded. By far the greater number of these injuries were traumatic, but functional spasm, functional paralysis, and combined organic and functional paralysis were met with. It is considered that many cases of so-called "concussed" nerve are in reality examples of "functional" paralysis. The importance of the electrical examination is emphasised, and the Lewis Jones condenser apparatus highly praised. Healthy muscles correspond to 0·025 microfarad; muscles showing partial R.D. require from 0·10 to 0·5 microfarad, and those showing complete R.D. require from 0·5 to 3 microfarads, or even more. A muscle contracting to 0·05 microfarad is likely to regain voluntary power in a few weeks, as compared with one which only contracts to 0·25 microfarad, and which requires months for recovery.

Cases showing no improvement after three months should be submitted to operation. If associated with the intense pain to which the term "causalgia" has been given, and in which the nerve is usually found incompletely divided, and wrapped in scar tissue, early operation should be advised. Operation, however, should always be postponed until sepsis has disappeared; the mere fact, also, that the wound has been the seat of suppuration is sufficient to exercise a markedly retarding effect upon regeneration of the nerve. It cannot be too often pointed out that the results of operation depend largely on the non-operative treatment, both before the operation and after, so that the muscle, tendon, and joint may be ready to respond to the impulses which one day the regenerated nerve will convey. In the case of primary suture protopathic sensation commences to return in about six weeks, and is completed in six months, while epicritic sensation and motor power return in about six months, and are completed in about twelve months. In secondary suture protopathic sensation as a rule takes twice as long to return; epicritic sensation requires twelve months for commencement, and never becomes perfect;

while motor power commences to return after about nine months, and rarely becomes perfect.

The book is essentially readable, and should prove of much use.

CEREBRO-SPINAL FEVER. MICHAEL FOSTER, M.D., and J. F. (610) GASKELL, M.A., M.D. Pp. x + 222, with 9 coloured plates, 3 figs. and 5 charts. The University Press, Cambridge. 1916. Pr. 12s. 6d. net.

THIS book has for its aim an attempt to bring together and correlate the clinical and pathological facts which the authors were able to accumulate during the epidemic of 1915. The views here set forth are the outcome of clinical and pathological observations made in the wards, the laboratory, and the post-mortem room of the First Eastern General Hospital, each case having been fully investigated by the same observers working in conjunction from its commencement to the termination of the illness. Every variety of the disease so far described came under observation. The chapters deal successively with history, symptoms, diagnosis, acute forms, sub-acute and chronic cases, course and prognosis, treatment, pathology, and epidemiology, while a special chapter is devoted to the changes in the cerebro-spinal fluid and the cultivation of the meningococcus from it, from the blood and from the urine, and another to the bacteriology of the meningococcus and other Gram-negative diplococci.

The first authentic account of an epidemic is that which occurred in Geneva in 1805. According to Hirsh the epidemic prevalence of the disease may be grouped into four periods, namely 1805-1815, 1837-1850, 1854-1875, and 1876-1886. The present, or fifth period, may be regarded as beginning in 1896 and stretching to the present day. The apparently enigmatical march of the old epidemics may be understood now when an attempt is made to trace their path in the light of our recent knowledge of carriers.

The illness is, as a rule, sudden, without premonitory symptoms. After the onset of headache, vomiting almost always occurs, followed by delirium. This may pass into a state of stupor and later coma. If the pressure be relieved, rapid recovery may result. Four distinct varieties of rash may be observed: (1) a macular rash, (2) a fugitive erythema, (3) a petechial rash, and (4) vibrices, or large purpuric spots. Out of thirty-nine cases, twenty-six showed affection of the sphincters, a symptom upon which no great stress has yet been laid, but which the authors consider to be of considerable importance from the point of view of early diagnosis. Rapid wasting is also characteristic. The clinical value of Kernig's sign cannot be exaggerated, although it must be remembered it is normal in infants up to two years of age. Optic

neuritis is curiously uncommon compared with its relative frequency in other forms of meningitis. Only two out of thirty-nine cases gave a history of sore throat. Head retraction is to some extent dependent upon increased intracranial pressure, and is often greatly or entirely relieved by reduction of the cerebro-spinal fluid pressure to normal.

The culture of the meningococcus from the cerebro-spinal fluid is in many cases easy. It is very difficult to cultivate it from the blood even in fulminating cases, and this suggests that the invasion is not primarily from the blood. The successful isolation of the organism from the urine is so difficult as to be of little value for diagnosis.

The disease is spread by direct contagion from person to person, the organism being carried in the nose and throat. The throats of carriers are clinically normal. If only very free ventilation is present, the risk of nurses and orderlies becoming carriers is slight. The treatment of a carrier is unsatisfactory, probably a mild antiseptic in a nasal douche is best. The authors are inclined to believe that a confusion between the *Micrococcus catarrhalis* and the meningococcus is the reason for the description of a catarrhal stage in meningococcal infections.

The results obtained by the authors with antimeningococcal serum were very disappointing. Of 9 cases treated with serum, 5 died, a mortality of 55·0 per cent., while of 30 cases treated without serum, only 9 died, a mortality of 30 per cent. Repeated lumbar puncture with adequate drainage of the sub-arachnoid space is the most important therapeutic measure we possess. Probably no drug is of value except for the relief of symptoms.

The book is full of information, all of which is based upon the personal observations of the two authors. It is thus a most important and valuable contribution to the subject of cerebro-spinal fever. It is clearly written, and represents much work carefully carried out by two investigators of experience. We recommend it strongly as an excellent piece of work. The type is good, and the coloured illustrations showing the different types of skin eruptions, the pathological appearances of the brain and spinal cord, &c., are of quite unusual merit. We notice that on p. 92, line 21, the word "dura" is evidently a misprint for "pia." An interesting account is included in an appendix of the spread of the meningococcus from carrier to carrier in a regiment which had been transferred to the authors' district, leaving one of its members behind ill, who subsequently died of cerebro-spinal fever. There is a bibliography and an index.

ABNORMAL FORMS OF TETANUS. (**Les formes anormales du tétanos. Étude clinique, pathogénique, prophylactique et thérapeutique.**) M. COURTOIS-SUFFIT and R. GIROUX. **Preface by** Prof. Widal. *Collection Horizon. Précis de médecin et de chirurgie de guerre.* Pp. iv + 175. **Masson et Cie, Paris. 1916. Pr. 4 fr.**

(611)

THE prophylactic value of anti-tetanic serum for the prevention of tetanus is now established. In cases, however, in which the original amount of serum injected has not been sufficient to produce complete immunization, symptoms of a modified clinical type develop, and such forms afford valuable additions to our knowledge of tetanus.

The ordinary symptoms of tetanus are well known. This book does not deal with them: it is only concerned with the atypical forms. These may be divided into two groups:—*First*, splanchnic tetanus, cephalic tetanus, and unilateral tetanus. Cephalic tetanus is by far the largest of these three types, and follows wounds of the head. It may be divided into (*a*) simple cephalic tetanus, (*b*) cephalic tetanus with dysphagia, (*c*) cephalic tetanus with facial paralysis, (*d*) cephalic tetanus with ophthalmoplegia, and (*e*) cephalic tetanus with paralysis of the hypoglossus. The *second* group consists of various types mostly limited to one limb, and comprises monoplegic and paraplegic forms, localised abdomino-thoracic tetanus, and incomplete forms of slow evolution and prolonged incubation. Numerous cases are described, and the history, etiology, pathogenesis, evolution, and prognosis are all discussed. Under the heading of treatment, prophylaxis and curative treatment is considered. This consists mostly of complete disinfection of the wound locally and the injection of antitetanic serum. Other methods, however, are also discussed, such as the injection of oxygenated water, &c. The efficacy of preventive serotherapy is accepted. Intra-cerebral injection is not recommended. Sub-arachnoid injection is complicated by the difficulty of performing lumbar puncture, and may produce a mild aseptic serous meningitis. Subcutaneous injection is above criticism. Injection of carbolic acid should be limited to mild cases.

The book concludes with a résumé of the different abnormal types described, their frequency, principal clinical signs, diagnosis, and prognosis. There is also a bibliography of the literature.

Review

of

Neurology and Psychiatry

Original Articles

A STUDY OF THE ANATOMICAL LOCATION AND HISTOPATHOLOGY OF NINETY-NINE BRAIN TUMOURS.

By FREDERICK B. CLARKE, M.D.,
Milwaukee, Wis., U.S.A.

From the laboratory of Neuropathology of the University of Pennsylvania, Philadelphia.

(With Plates 9, 10, and 11.)

1. INTRODUCTION.

2. Classification as to region involved and nature of tumour.
   - (*a*) Gliomata and ependymomata.
   - (*b*) Endotheliomata.
   - (*c*) Sarcomata.
   - (*d*) Gummata and tuberculomata.
   - (*e*) Carcinomata.
   - (*f*) Tumours of the third ventricle.
   - (*g*) Tumours of the fourth ventricle.
   - (*h*) Tumours from mesoblastic and epiblastic tissue.
   - (*i*) The relative frequency of involvement of the left side by intra- and extra-cerebellar tumours.

3. Neurogliar proliferation in the cerebrum as a result of new growths.

4. Hydrocephalus resulting from brain tumour.
   (*a*) From supra-tentorial tumours.
   (*b*) From sub-tentorial tumours.

5. Displacement of the cerebellum and distortion of the brain stem from extra-cerebellar tumours.

6. Cysts occurring with tumours.

7. Hæmorrhage occurring in brain tumours.

Introduction.

This study of the regional involvement and histopathology of the tumours of the brain, comprising those in the laboratory of neuropathology of the University of Pennsylvania, was undertaken because so few collections of brain tumours have been reported within the past few years. The greater number of tumours in this series have been described in the literature, and one study of forty-nine of these was made by Weisenburg[1] in 1910.

The tumours included in this study were, with but few exceptions, obtained at autopsy, and the regional involvement of the few removed at operation is well known.

This study does not include those in which a part of the tumour was removed at operation, and the extent of the tumour was unknown. There were 99 tumours in this series. Classified as to histopathology, these were: Gliomata and ependymomata, 38; endotheliomata, hemangio-peritheliomata and peritheliomata, 37; metastatic carcinomata, 7; gummata, 6; tuberculomata, 5; sarcomata, 4; glia sarcomata, 1; blood cyst, 1. The regions chiefly involved by these tumours are shown by the accompanying chart. Many were exceedingly large, and had extended to regions contiguous to those primarily involved.

Tumours of the fore-brain were fairly equally distributed in the two principal subdivisions of this part of the brain. Those arising from structures above the tentorium numbered 66, and those sub-tentorial in origin numbered 33. The incidence as to the side of the brain involved, shows that 45 occurred on the right and 37 on the left side, and 17 were near or in the centre of the brain. Considered as to sex, 58 developed in males and 37 in females, and in 4 the sex was not given.

	Glioma.	Ependymomata.	Glia-Sarcoma.	Endothelioma.	Perithelioma.	Hemangio-Perithelioma.	Carcinoma.	Tuberculoma.	Gumma.	Sarcoma.	Blood Cyst.	Total.
Frontal	5	...	1	4	1	...	...	...	3	...	...	14
Peri-and post-central conv.	5	...	...	3	...	...	...	2	2	1	...	13
Temporal	3	...	...	4	...	...	1	...	1	1	...	10
Parietal	3	...	...	2	1	...	...	...	...	2	...	8
Occipital	3	...	...	1	...	...	...	...	...	...	...	4
Optic thalamus	2	...	...	...	...	...	1	...	...	...	...	3
Lenticular nucleus	3	...	...	1	...	...	...	...	...	...	...	4
Third ventricle	2	...	...	...	...	...	...	...	...	...	...	2
Mesencephalon	...	...	...	1	...	...	...	...	...	...	...	1
Pons and medulla	4	...	...	...	...	...	...	2	...	...	...	6
Cerebral peduncle	1	...	...	...	...	...	...	...	...	...	...	1
Cerebellum	2	...	...	...	...	...	...	1	...	...	...	3
Fourth ventricle	2	3	...	1	...	...	...	...	...	...	...	6
Extra-cerebellar	...	...	...	17	...	...	...	...	...	...	1	18
Pituitary body	...	...	...	...	...	...	3	...	...	...	...	3
Multiple locations	...	...	...	...	...	1	2	...	...	...	...	3
Total	35	3	1	34	2	1	7	5	6	4	1	99

Gliomata and Ependymomata.—There are in this series thirty-eight tumours of glial origin, thirty-five arising from the supporting glial tissue, and three from the ependymal lining of the fourth ventricle.

They constitute 38·3 per cent. of the total number. This is much less than the percentage found by Tooth,[2] which was 49·2 per cent., but is approximately the same relative frequency as found by Cushing[3] in his description of seventy tumours, in which gliomata and gliomatous cyst constituted 38·5 per cent. of the total number.

Gliomata were much more frequent above the tentorium than below, there being twenty-seven having origin above the tentorium as compared with eleven sub-tentorial in origin.

A glioma grows by infiltration and replacement of brain tissue by tumour cells. This is, from the evidence of increase, in the size of the part involved, more than a replacement, and it may well be considered in the nature of a replacement and over-growth of

new tissue beyond the amount necessary to replace the destroyed structures.

It is not always possible to determine microscopically the limits of such a tumour, for there is usually adjacent a well-marked area of gliosis which can be shown microscopically to extend gradually with less intensity until quite a distance from the tumour is reached, where it merges into normal tissue. Occasionally a glioma may be fairly well defined, which admits of its removal. In one case of this series a small cortical glioma had been present for eight years, and had been partially removed. At autopsy, a fairly well-defined glioma was found.

In another case a glioma was removed, which was well defined. It recurred six years later, and was again successfully removed, but later recurred and caused death.

A glioma may present great variability in rapidity of growth, character of cells, relation to surrounding tissue, vascularity, and in tendency to cyst formation.

One of the specimens in this series had produced symptoms for only six weeks before causing death; another had been present for over eight years before causing marked symptoms. A possible explanation for this would seem to be in the fact that a gliosis may have persisted for a long period of time before developing into a rapidly growing tumour, or the resistance of the brain to the invasion of rapidly growing cells may have been maintained for a considerable period of time. This resistance of the glia tissue to invasion is well known, and is amply shown by the resistance to perivascular infiltration, or by the resistance of the cortices to marked acute or chronic involvement of the pia. Another possibility is the persistence of axis cylinders in glioma as shown by Byrnes[4] in work from this laboratory.

These tumours are probably of embryonic origin, which accounts for the great variability in the type of tumour cell which may be observed in different sections of a tumour. The cells may be small, with no demonstrable protoplasm, but surrounded by a heavy glial feltwork, and in this stage indicating quiescence; or they may be large, possessing several nuclei and having a well-marked protoplasm, and appear to be actively proliferating. The amount of glial fibrils also varies markedly in different tumours and in different sections from the same tumour. In some specimens examined the cells predominate and are seen in active division,

with but little protoplasm. This type is so suggestive of sarcoma that the diagnosis is at times difficult. The type of cell also shows great variability, at times being clearly glial in type, and in some instances distinctly of the ependymal type.

One interesting tumour of glial origin involved the structures surrounding the third ventricle, having infiltrated them to varying distances, but the extent of the infiltrating cells was sharply defined. The cells of the tumour tissue within the ventricle were of an undifferentiated glial type, and but few were suggestive of an ependymomata. The greater number were small, without much protoplasm, and were actively proliferating. Occasionally a cell was found with a large amount of protoplasm and containing several nuclei. The nuclei in many contained dark granules arranged symmetrically, indicating mitotic cell division, while others had the appearance of direct cell division. Where the tumour cells were adjacent to normal brain tissue, projections of fibrils could be seen extending a short distance between the cells, but for the greater part few glial fibrils were found. The cells seemed so loosely attached that many must have been carried away by the cerebro-spinal fluid, but there was no indication of a secondary growth.

The relation to surrounding tissue presents various degrees of difference. For the most part the tumours are infiltrating, and a few only fairly well circumscribed. The possibility of the axis cylinders of the capsule limiting in some degree the tumour invasion is shown in a few instances macroscopically as well as microscopically. Such a difference in vascularity is observed, even in the same tumour, that the colour, which depends upon this factor, varies markedly. Some areas appear almost white, and from this colour there are varying shades of grey, yellow, and reddish grey.

The vessels themselves show marked difference in size and formation of their walls; some are merely irregular spaces with endothelial lining, others show marked hyperplasia of the endothelial intima, which has progressed to the point of occlusion. In others there is a dense feltwork of glial fibrils surrounding the vessels.

The blood vessels are evidently a factor in determining the limitation of growth, as shown by Tooth. Destruction and necrosis, so frequent as an end stage, are due, as he thinks, to a limitation of the blood supply produced by the activity of the glioma, causing

a reaction of the endothelial lining of vessels with a resulting obstruction. This hypothesis is to me quite tenable.

Gliomatous Cysts.

Cyst formation, which is such a frequent finding in glioma, was marked in only four specimens, although small cystic areas are very frequently seen with the microscope.

Councilman,[5] in his studies of glioma, writes: "In glioma the cysts are not the result of cell secretion, nor do they represent areas formerly the site of degeneration. They are due to the fluid absorption of the tissue, and represent an accentuation of the condition common to the entire tumour."

Tooth regards cyst formation as the result of an atrophic and degenerative process, and believes the cysts to be an evidence of long life of the growth. He believes that the degenerative process is the result of vascular occlusion.

It is quite common to find an area where the fibrils are apparently disappearing, in some instances the greatest number remaining around the vessels. Such areas are frequent in the same section at no great distance from a very active process. The greatest variety of change is found in the same section of a glioma, the cells in one part showing an intense activity, while in other areas the activity has apparently reached its height, and a state of quiescence is reached. Other areas show a destructive process, evidently due to lack of nutrition, and irregular islands are found filled with a gelatinous material.

Such a process has evidently taken place in Fig. 1, which shows a markedly reticular area filled with fluid.

My attention has been so frequently called to such irregular reticular areas that my conclusion would be that they represent a process of degeneration and necrosis as the result of vascular interference, and constitute the first step in cystic degeneration. This is well shown in Fig. 1 and Fig. 2, in which the spaces formed by the reticular structures are filled with a homogeneous gelatinous material.

In a recent case, where the symptoms developed rapidly and death occurred only a few months after the first symptom, there was observed surrounding the glioma marked increase in size of the vessels, while in the centre, and presumably the oldest portion

of the growth, none were seen. In this area the tissue was soft and exceedingly friable even after having been in 4 per cent. formaldehyde for ten days.

Endotheliomata.—Thirty-seven tumours having origin from endothelial cells, either from the dura or blood vessels, constitute 37·3 per cent. of the total number. They were found with approximately the same relative frequency as gliomata, but, unlike the latter, occurred with the same degree of frequency in both the supra- and sub-tentorial regions.

They occurred in much greater frequency than in either Cushing's or Tooth's series, which were 11·1 per cent. and 14·3 per cent. respectively. This is, I think, due to the relatively greater number of tumours in this series occurring in the posterior cranial fossa.

A few years ago the tendency was to call all large, hard, well defined tumours arising from the dura and being relatively rich in fibrous stroma, fibroma or fibrosarcomata. This was probably due to the fact that the fibrous stroma constituted the greater part of the bulk of the tumour, and basing a diagnosis upon the predominating cell present in the entire tumour mass, the conclusion reached was that the tumour was a fibroma or fibrosarcoma. In other words, the fibroblastic cell constituting the stroma was mistaken for the type of cell really responsible for its proliferation.

One important fact in tumours of this type is, that in the greater number, the length of time of growth produces an increase of stroma without increase in the number of true tumour cells which are found in the centre of the characteristic whorls. In some tumours, developing over a period of years, the endothelial element of the tumour had largely disappeared, leaving a dense fibrous stroma which had a tendency toward annulation around a few cells of endothelial origin. These cells had in some instances undergone hyaline change, and in a few instances a still further change had resulted in the formation of psammoma bodies.

The fibrous stroma of some endotheliomata has evidently proliferated and increased in density out of all proportion to the amount present in the early stages of the tumour formation. This would seem to be nature's method of limiting the activity of the endothelial tumour cells. That a process of self limitation of growth occurs is shown by the hyaline and calcified bodies not infrequently seen in endothelioma. These bodies would seem to

represent a retrograde change in the cellular elements of the tumour as the result of interference with their nutrition. They are found at times within blood vessels of the stroma which have undergone a proliferation of the endothelial lining resulting in occlusion.

Endotheliomata arising from the dura in the posterior cranial fossa have been in this series well formed, but those of the anterior and middle fossæ have in a few instances been diffuse in their growth and highly malignant, involving the bones of the cranium in a few instances.

There has been some question as to the cells of origin of endotheliomata, arising from the membranes surrounding the brain. Cushing[6] believes that they arise from the cluster of mesothelial cells of the arachnoid villi or tufts, which project into the dura and which are the points of outlet of the cerebro-spinal fluid.

An exceedingly interesting type of tumour arising from the endothelial lining of blood vessels was encountered three times. One was a hemangio-perithelioma, which has been reported in detail.[7] It consisted of multiple metastatic growths, situated in various parts of the brain. They were round, well defined from the brain substance, and it would seem that, having reached a diameter of about 3·5 cm., a hæmorrhage would occur which destroyed the tumour cells, leaving a well-defined clot within a circular cavity, which had remarkably smooth and well-defined sides.

The smaller tumours in which hæmorrhage had not occurred showed a formation of cells around the blood vessels, the lumens of which were well defined and lined by endothelial cells, which were rather distinct in character from those surrounding them. There was in all sections evidence of cells of endothelial type tending to form new vessels, even at a distance from the tumour mass.

The other two tumours, showing a similar arrangement of cells forming blood vessels, were not multiple nor metastatic in origin, and hæmorrhage did not occur. They evidently were derived from endothelial cells of the type common to blood vessels, and were tending to differentiate into cells whose function is to form capillaries and blood vessels.

Sarcomata.—This is a relatively rare tumour, occurring four

times, the most interesting type being a melanotic sarcoma of metastatic origin. This sarcoma developed from a pigmented mole on the back, which gave numerous metastases to the heart, lungs, abdominal viscera, and one to the parieto-occipital lobe of the brain, where it reached an enormous size, practically destroying the posterior one-third of the right cerebrum. The tumour is dark, well defined, and microscopically the section is filled with minute brownish granules of melanin. The cells are variable in size, the small round type predominating, and they suggest very rapid growth.

Gummata and Tuberculomata.—The frequency of these two types of granulomata was approximately the same, being six and five respectively. The gummata in all instances developed in the cerebrum, and evidently were of meningeal origin. They were rather diffuse in three, and tended to be well defined in three specimens; one growing from the dura, and measuring 4·5 by 3 cm., was successfully removed.

Tuberculomata occurred twice in the pons, once in the cerebellum, and twice in the motor region. They were in all instances within the brain substance.

Carcinomata.—Adeno-carcinoma of the pituitary gland were three in number. All were large masses, completely filling the middle cranial fossa, and in two instances had compressed the third and anterior horns of the lateral ventricles.

Metastatic carcinoma occurred twice, and multiple metastatic carcinoma was found in two specimens, in one of which there were at least thirteen well-marked tumour masses in the brain.

Tumours of the Third Ventricle.

Tumours of the third ventricle are exceedingly infrequent. Weisenburg[8] collected twenty-seven cases from the literature, to which he added three of his own, and described a symptom complex common to tumours of this region. Several additional cases have been reported by Pollock[9] and by Hall.[10]

There were two in this collection, one of which is described in this paper under gliomata. The other was a large, soft mass, completely filling the third ventricle and crowding outward into the lateral ventricle of the left side. The cells were of a peculiar and not well differentiated type, glial in origin. Many were

spindle shaped, some large, some small, with a relatively small amount of protoplasm and with but a few fibrils.

Tumours of the Fourth Ventricle.

Tumours arising from the structures within the fourth ventricle are interesting from both the clinical and pathological standpoint. There are in this series six specimens, three of which remained confined to the ventricle, and three did not. They are classified as to tissue of origin and the character of cells, one endotheliomata, two gliomata, and three ependymomata.

The endothelioma were large, measuring 4·6 by 3·2 by 3·1 cm., being of rather firm consistency, and rich in cellular structure.

The three ependymomata are interesting. They did not remain confined to the fourth ventricle, but made their way to the surface of the brain, and spread over the neighbouring structures, one having spread over the left cerebellar lobe, forming a tumour from 2 to 3 cm. in thickness.

One extended forward over the pons and along the base of the brain, involving the Gasserian ganglion on each side. This tumour had also given rise to metastasis in the dura at many levels of the cord.[11] These tumours were without exception soft, friable, and exceedingly active in proliferation. In all these specimens there was a marked tendency of the cells to line all surfaces with which they came in contact with a pavement-like arrangement of cells. There was also characteristic cavity formation, which was lined by these cells. The remaining two tumours were evidently of glial origin, but of an early undifferentiated type.

There were three tumours having origin outside the fourth ventricle, but growing into it, filling it completely in two instances, and partially in another. It is interesting to note that two of them were tuberculomata. It would seem that tumours of the posterior cranial fossa arising within the brain substance have a tendency to involve the fourth ventricle, since it has been true in nine of the twelve specimens.

I have been able to find but fifty-two cases in the literature, and they were for the most part glial in origin.

Tumours from Mesoblastic and Epiblastic Tissue.

Endothelioma and glioma occurring together and constituting

a tumour is an exceedingly unusual condition. There was one tumour of this character in this series which has not previously been described.

The term glia-sarcoma should be restricted to those tumours which show cells of a type indicating that the growth was from both epiblastic and mesoblastic tissue. With this conception, tumours of such origin are infrequent, although until very recent years the tendency to call richly cellular glioma a glio-sarcoma was quite prevalent.

The tumour to be described would, being from both epiblastic and mesoblastic structures, come within this classification. However, the origin of the growth from the dura, and the marked tendency of the cells representing the mesoblastic tissue to present a marked annulation of growth characteristic of endothelioma, would suggest the term of endothelial glioma.

If it is held that a rapidly growing and infiltrating endothelioma is a sarcomatous tumour, then this one would belong in the classification of glio-sarcoma.

Councilman [12] has recently described a tumour of this character, in which the two types of tissue interlaced and were in close relationship to each other.

No. 583 is a large tumour within the left cerebral hemisphere, causing a marked increase in size. The dura is adherent to the tumour over the vertex of the hemisphere and along the precentral convolution, covering an area 5·5 by 4·5 cm. The tumour from the dura extends downward until the greater part of the hemisphere is involved, but the growth does not involve the basal ganglia, and the greatest diameter of the tumour is parallel with the anterior posterior diameter of the brain, measuring 6·5 by 4·5 cm.

There is a large cyst within the tumour, having irregular and friable walls. The thalamus is crowded against the third ventricle, causing a slight dilatation of the left anterior horn, and a moderate dilatation of the right posterior horn of the ventricle.

Cut section shows the tumour to be firmer in consistency than the average glioma, and more sharply defined, but not encapsulated. The growth has been at least partially by infiltration rather than expansion.

The periphery of the tumour in some places shows a well-marked gliosis sharply delineating the growth. In general the

tumour is very rich in cells, and little fibrous stroma can be found. The blood vessels are very few, and surrounded by thickly implanted cells.

The cells from mesoblastic origin present a well-marked tendency to annulation, and well-marked whorls are constant, and predominate in various fields, suggesting an endothelioma; however, in some sections these annulations of connective tissue origin entirely surround groups of cells which are not of the same type. In other areas the two types of cells are sharply defined from each other. Still other areas show the two types of cells closely intermingling with each other. Fig. 3 shows the arrangement of the two types of cells.

The cells of mesothelial origin present various types, the predominating cell being of a large spindle shape, with but scant protoplasm, although many of the cells are round, being both large and small in type.

The cells of glial origin are for the most part large, with varying amount of protoplasm and little tendency to fibril formation. They show an intense activity and both types of cell division are seen.

The Relative Frequency of Involvement of the Left Side by Intra- and Extra-Cerebellar Tumours.

A review of the series of twenty-two tumours of the posterior cranial fossa, verified, at operation or autopsy, by Stewart and Holmes,[13] discloses the interesting fact not commented upon by them, that in thirteen tumours, extra-cerebellar in growth, eleven, or 84·6 per cent., occurred on the left side, and of the nine intra-cerebellar growths, five were confined to the lateral lobes. Of this number four, or 80 per cent., occurred on the left side.

In this series of nineteen extra-cerebellar growths the left side was involved eleven times, or 72·7 per cent., and in intra-cerebellar tumours involving a lateral lobe, of which there are two, both occurred on the left side.

A predilection for the left side in tumours of this region would be indicated by the above findings, although the number is not sufficient for definite value, and observation of a greater number is desirable.

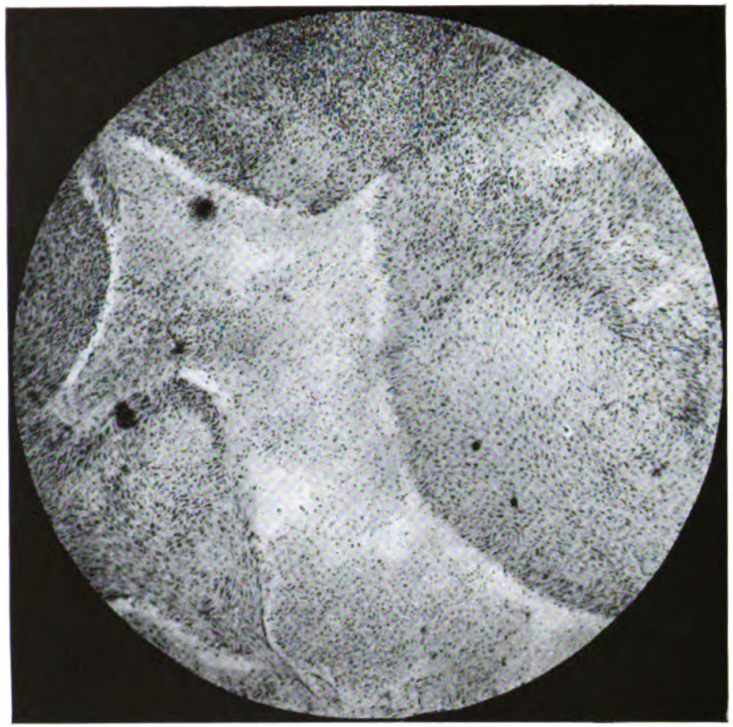


FIG. 3, No. 583.—Illustrating two types of tumour tissue. The sarcomatous tissue ends in a sharp, well-defined line.

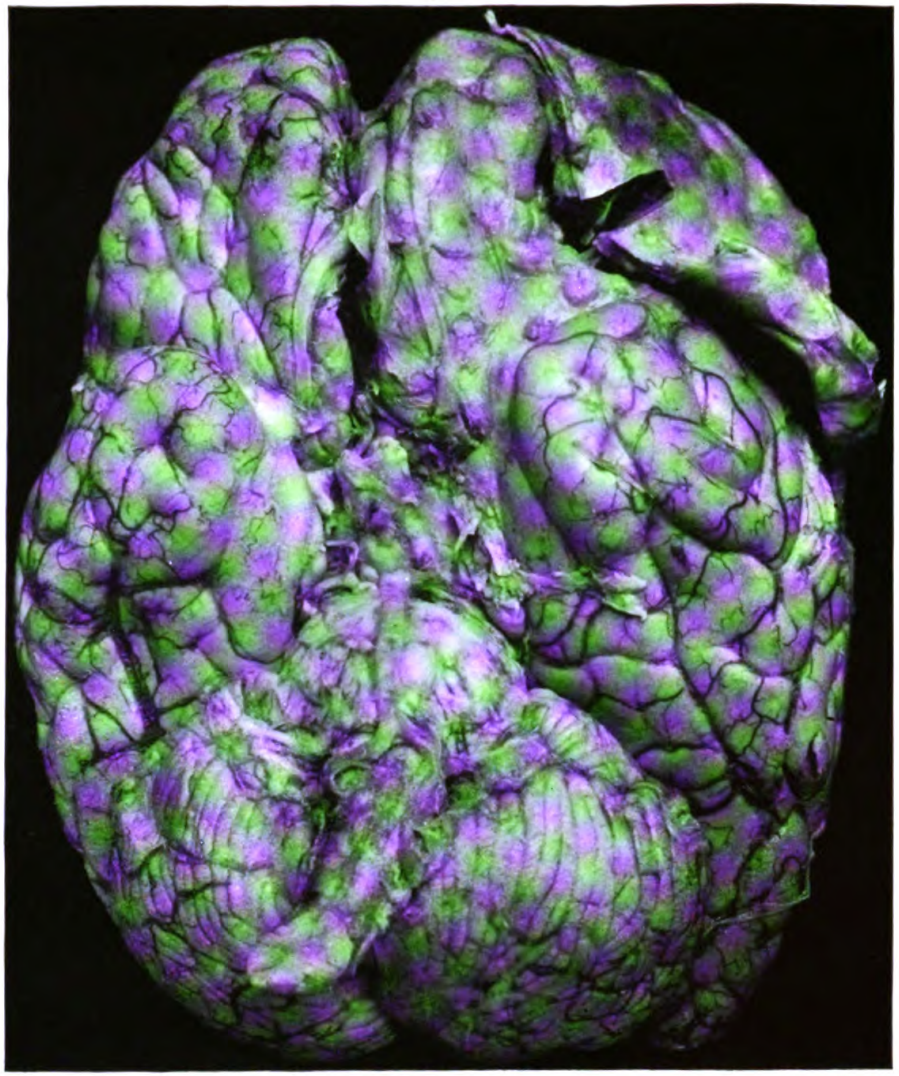


FIG. 4, No. 699.—Marked enlargement of the left hemisphere from a gliosis; also marked thickening of dura over the tumour mass.

PLATE X.

Neurogliar Proliferation in the Cerebrum as the Result of New Growths.

On looking at a number of cross sections of brains containing tumours, the one striking thing above all others is the enlargement of the hemisphere containing the tumour. This is present in the majority of all specimens in the cerebral hemisphere, irrespective of the nature of the growth, but more marked in glioma. This increase is out of proportion to the increase in bulk produced by the addition of the tumour, and some other cause must be operating.

Spiller,[14] with part of the material utilised in this series, has shown that the increase in size of the hemisphere is due to a reactive gliosis which may extend to a considerable distance from the tumour, and is independent of the character of the tumour.

Oppenheim speaks of gliosis as the result of the presence in the brain of a new growth.

Councilman, in a recent study of twenty-five gliomas, has arrived at the same conclusion, and described gliosis in one instance 8 cm. from the macroscopic evidence of the tumour.

One tumour in this series, No. 699 (Fig. 4), a gumma, involved the anterior pole of the frontal lobe on the right side and extending over the inferior surface of the lobe.

The dura was markedly adherent to the brain tissue, which was softer than normal and showed destruction of the brain tissue 2·5 cm. from the anterior surface of the frontal lobe. A reactive gliosis is shown by the photograph extending at least 8 cm. from the posterior margin of the tumour, so marked as to partly occlude the anterior horn and change the usual appearance of the internal capsule. Sections were taken 4 cm. and 6 cm. respectively from the posterior margin of the tumour and stained by Mallory's neuroglia stain, which showed a marked increase in glia fibrils without a greatly increased number of glia cells, which did not show signs of marked activity and were apparently in a resting stage. The glia cells were small, with no greater amount of protoplasm than is normal. There was but little evidence of involvement of the vessels.

It is usually held that the reactive gliosis around a tuberculoma is greater than that associated with gumma. Councilman remarks, in discussing reactive gliosis, that such circumscribed syphilitic foci as gumma produce much less proliferating change than do

tuberculous lesions. A gumma is perhaps not so likely to be circumscribed as tuberculous growth, and since the development of new tissue is due to the reaction of tissue to certain organisms, the degree of glia reaction adjacent to tissue actually involved by the organism should be fairly comparable.

The reaction gliosis to tumours should be, it would seem, more marked than to an infectious granulomata unless they were of very slow growth; however, this would not necessarily be true, and in one instance of a very rapidly growing gumma gliosis occurred at a great distance.

Several tumours other than glioma were studied to determine gliosis, with the result that it was frequently found in variable degree.

Hydrocephalus from Tumours. Supra-Tentorial Growths.

In sixty-six tumours twenty-nine were examined for hydrocephalus, with the result that some degree of dilatation was present in thirteen.

The usual manner by which hydrocephalus occurs is occlusion of the foramen of Monro, resulting from pressure exerted by the tumour growing in the opposite side of the brain.

Tumours of the basal ganglia may cause obstruction to the flow of cerebro-spinal fluid in the third ventricle, leading to enlargement of the lateral ventricle on the side opposite the tumour, and dilatation of the anterior and posterior horns on the side of the growth.

In two instances tumours of the pituitary body caused dilatation of all four horns of the ventricles, by reason of having exerted pressure upward against the third ventricle.

Compression of the lateral ventricle on the side of the tumour and occlusion of the third ventricle by a tumour in the region of the basal ganglia, are not infrequent, but usually do not lead to dilatation of the lateral ventricle of the opposite side.

Hydrocephalus Resulting from Sub-Tentorial Tumours.

There are in this group thirty-three tumours. Classified as to their histopathology: endotheliomata, 19; gliomata, 8; ependymomata, 3; tuberculomata, 2; blood cyst, 1. Considered from the location of growth there are eighteen extra-cerebellar and

fifteen within the brain; of the latter, nine have remained confined within the cerebellum or pons, and three, although arising from the fourth ventricle, have made their way to, and spread out over, the surface of the brain tissue.

Eleven of the eighteen extra-cerebellar tumours could be examined for hydrocephalus, with the result that seven, or 63·6 per cent., showed in some degree dilatation of the ventricles.

Of the four tumours involving the pons, three could be examined, and slight enlargement of the right posterior horn of the lateral ventricle found.

In tumours developing within the cerebellum, of which there were nine, and seven examined, six, or 66·6 per cent., showed hydrocephalus in some degree. Hydrocephalus may not be uniform in the third and lateral ventricles, and it is of interest and importance to note that: (1) The lateral ventricles may be enlarged, the third remaining normal; (2) the third ventricle may be enlarged, and the lateral remain normal; (3) the third ventricle may remain normal, and both posterior horns of the laterals may be dilated; (4) the lateral ventricle of one side may show greater dilatation than the other, and the greater dilatation may be on the same side as the tumour, as was the case in two specimens.

An interesting observation is, that the three tumours developing within and remaining confined to the fourth ventricle all produced hydrocephalus, while of the three developing within the fourth ventricle and extending to and over the surface of the brain, only one caused a moderate and one slight hydrocephalus.

Tumours of the fourth ventricle are relatively infrequent. Stern collected fifty cases from the literature; he describes another case in which the diagnosis was in doubt, and hydrocephalus resulting from tumour was found at autopsy.

It would seem that in tumours of this location errors of diagnosis would be great—in fact, the diagnosis is usually made at autopsy.

The degree of hydrocephalus was considered moderate with but one exception. In this specimen, No. 683 (Fig. 5), it was marked, due to obstruction to the ventricular circulation, by a large cyst which forced both lobes of the cerebellum upward.

Oppenheim states that "hydrocephalus always accompanies cerebellar tumours." In this series of twenty-three specimens studied, it had occurred in thirteen, or 56·5 per cent., and was

more frequent in intra- rather than extra-cerebellar tumours. It would seem that neoplasms of the pons are less likely to produce ventricular dilatation than either extra- or intra-cerebellar growths.

The size of the ventricles varies so markedly in brains considered normal, and moderate hydrocephalus occurs so frequently as a chance finding at autopsy, that the degree to which ventricular dilatation may reach before symptoms of increased intra-cranial tension result is without question unknown, and doubtless varies considerably. However, it must be quite different when caused by tumour, since the weight of the brain is normally about 14 per cent. less than the capacity of the skull, and the neoplasm, before becoming sufficiently large to interfere with the circulation of cerebro-spinal fluid, has probably already produced symptoms, the result of increased intra-cranial pressure. If, added to this, hydrocephalus occurs, the symptoms of increased intra-cranial tension may become suddenly intensified and localising symptoms greatly obscured.

It is of importance to remember that the lateral ventricle of one side, or one horn, may be dilated, leading to localising symptoms. That this can occur in conditions other than brain tumour is shown by the two cases reported by Cramer.

Hydrocephalus of the third ventricle may, by pressure upon the optic chiasma or tracts, produce a primary optic atrophy which would also add to the difficulty of diagnosis.

Hydrocephalus may produce symptoms which are construed as being due to brain tumours. On the other hand, brain tumours may be accompanied by such a degree of hydrocephalus that localising symptoms are obscured, and the general symptoms are those of hydrocephalus.

This is well illustrated by No. 683 (Fig. 5), in which case tumour was not suspected. Localising symptoms were not marked, and all general symptoms were thought to be due to hydrocephalus. At necropsy, marked hydrocephalus was found, and in addition a large cyst of the left lateral lobe of the cerebellum.

The manner by which brain tumours cause hydrocephalus would seem to be by an interference with the flow of cerebro-spinal fluid, by occlusion, from pressure on the foramina or aqueduct by which it flows from one ventricle to another, or from the fourth ventricle into the subarachnoid spaces.

FIG. 5, No. 685.—Illustrating crowding of the cerebellum upwards and forwards leading to marked hydrocephalus. Separation of occipital lobes.

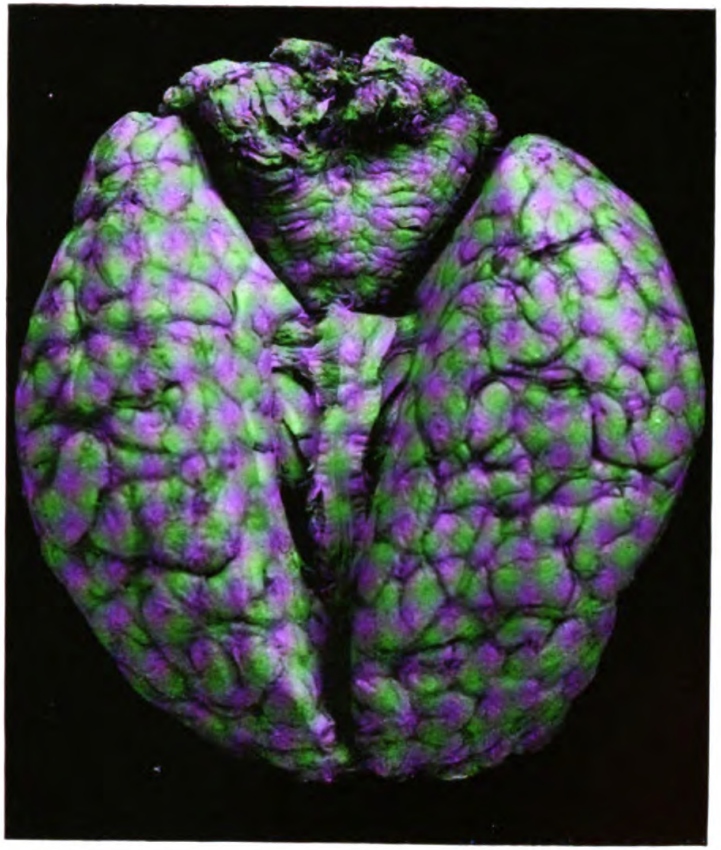


FIG. 6, No. 296.—Illustrating crowding of the cerebellum upward between the lobes of the cerebellum, by a tumour of the posterior cranial fossa. Separation of occipital lobes 9 cm.

There does not seem to be reason to believe that an increase of intra-cranial pressure by reason of tumour has interfered with the functional activity of the arachnoid villi or tufts, thereby diminishing the filtration of fluid into the sinuses.

Displacement of the Cerebellum and Distortion of the Brain Stem from Extra-Cerebellar Tumours.

There are seventeen tumours in the posterior cranial fossa of connective tissue origin, arising outside of the brain substance. Most of them are large, and all are hard and fibrous. Thirteen of these could be studied, and it was found that the greater number caused displacement of the cerebellum of some degree. In five instances marked displacement upward occurred, four of these by existing pressure upon the cerebellum, twisting and forcing it firmly between the occipital lobes. This is well illustrated by No. 296 (Fig. 6) and No. 685 (Fig. 5).

The direction of pressure upon the cerebellum is of prime importance in determining the extent and direction of displacement. A factor in limiting the extent of displacement is the dense unyielding character of the tentorium, which apparently is not so dense and firm in some instances as in others. A second factor is the amount of adhesions, which are in some instances marked, that may develop between the tumour, tentorium, and parietal dura. When this occurs, even although the tumour is large, atrophy of the corresponding lobe of the cerebellum occurs rather than marked displacement.

Tumours growing so that the greatest pressure is parallel to the greatest lateral diameter of the cerebellum do not cause such marked displacement or twisting of the cerebellum, but do cause atrophy of the proximal lobe and compression of the opposite. It would seem that the degree of atrophy is in inverse proportion to the rapidity of growth, a slow, growing tumour producing sufficient atrophy of the proximal lobe to accommodate itself, while a rapidly growing tumour tends to cause more compression than atrophy.

If the point of greatest pressure is below the plane of the greatest lateral diameter of the cerebellum, as is the case in most cerebello-pontine angle tumours, the lobe on the side of the tumour will be displaced upward and the corresponding lobe downward, causing a twisting of the cerebellum upon its attach-

ments to the brain stem. This is of importance in producing hydrocephalus by interference with the circulation of the cerebro-spinal fluid.

Pressure exerted upward against both lobes equally, as in No. 685 (Fig. 5), may produce such interference with the flow of cerebro-spinal fluid that marked hydrocephalus results.

The dislocation of both lobes upward does not occur unless the pressure is exerted equally under each, but pressure exerted downward against one lobe may lead to a marked twisting of the cerebellum upon its axis, pushing the lobe opposite the tumour upward between the occipital lobes, at the same time leading to a stretching of the cranial nerves on the side opposite the tumour. One tumour shows such a condition, which caused involvement of the fifth, seventh, and twelfth nerves on the side opposite the growth. This tumour has been described in the literature by Spiller.[15]

When a tumour tends to grow upward and backward from the angle, rather than downward and backward, so that the point of greatest pressure is in front of the lateral diameter of the lobes, and on a plane with the anterior posterior diameter of the lobe, this lobe is pushed backward and the distal lobe forward, causing a twisting of the cerebellum upon its attachments.

Displacement of the cerebellum from its normal relations is of sufficient frequency to receive consideration, when interpreting the location of tumour from cranial nerve involvement.

In connection with cerebellar displacement, the brain stem is often found to show marked kinking, and doubtless such disturbance of the normal relations of the medulla may either interfere with its blood supply, or cause pressure upon vital centres, leading to sudden death so frequent in tumours of the posterior cranial fossa.

Many enormous tumours are found in this region, and since increase in intra-cranial pressure is communicated alike to all parts of the brain, symptoms at distance are not infrequent.

Displacement of the cerebellum upward, causing separation and atrophy of the occipital lobes, occurred with relative frequency, being well marked in five instances. One tumour, No. 296 (Fig. 6), caused a separation of 9 cm. between the lobes. Such separation as shown by this specimen necessarily caused marked symptoms, not alone of the occipital lobes, but at a distance from

them. It is not unusual to find atrophy of the occipital lobes without separation.

Stretching of the tentorium, which must result from subtentorial tumours when a moderate size is reached, must be considered as a cause of headache, especially when persistently referred to the occipit and back of neck. Cushing mentions this probability. Stewart and Holmes, in their studies of tumour of this region, state that "headache is an early and almost constant symptom." They offer no explanation, nor "do they find support for Luciani's assertion that it is due to direct irritation of the cerebellar tissue," nor to Stewart's assumption that "its occasional frontal seat is due to radiation of stimuli along the fronto-pontine path."

Stretching of the tentorium or hydrocephalus are not mentioned by them as a probable cause.

It seems in accordance with the pathological evidence to consider that such causes may in large measure serve to explain why severe and persistent headache is so frequent.

Since studies have shown that the dura is well supplied by the fifth and ninth nerves, a tumour might reasonably be expected to produce severe pain of the dura when placed under tension.

Another factor in the production of general headaches that might reasonably be concluded from our pathological evidence is the occurrence of hydrocephalus, which, by augmenting the already increased intra-cranial pressure, may, by increasing the pressure upon the dura, produce pain.

Well-formed cysts occurring with brain tumour are relatively infrequent in this study, there being only six, three of which occurred in glioma, two in endothelioma, and one in glia-sarcoma.

Of the three cysts, the result of degenerated gliomatous areas, two occurred in the cerebellum and one in the cerebrum. The two endothelioma with cysts were located, one in the right cerebral cortex and the other in the middle cranial fossa. This latter specimen is of interest. There are two tumours, one on the right middle fossa 1·5 cm. in diameter, growing between the dura and the petrous portion of the temporal bone, in the position occupied by the Gasserian ganglion. There is a cyst filled with a thin fluid, 2·5 by 2·5 cm. in diameter, connected to this tumour by a pedicle, but it is posterior to the petrous portion of the temporal bone under the tentorium and within the posterior cranial fossa.

Hæmorrhage Occurring in Brain Tumour.

The blood vessels within tumours are, as a rule, imperfectly formed, and in some rapidly growing tumours are but little more than irregular areas filled with blood, the walls being very thin and supported chiefly by tumour tissue, consequently hæmorrhage of various grades of severity is relatively frequent.

The colour of tumours is largely dependent upon their vascularity; imperfect formation of new vessels, and the fact that vessel walls are frequently weakened by reason of being infiltrated by tumour cells, leads to capillary or larger hæmorrhage.

Hæmorrhage of sufficient size to increase the existing symptoms occurred within, and remained confined to the tumour in eight specimens. Of the eight tumours giving rise to hæmorrhage, the greater number were glioma.

Hæmorrhage of sufficient amount as to be the probable cause of death occurred eight times, in three instances at a distance from the tumour. One tumour of the cerebello-pontine angle was complicated by a hæmorrhage into the frontal lobes of the same side, a gumma of the temporal lobe by a hæmorrhage into the tegmentum of the pons, an endothelioma of the fourth ventricle by a large hæmorrhage into the lateral lobe of the cerebellum.

In five instances hæmorrhage evidently arising from within the tumour was of sufficient size to make its way to a considerable distance from the tumour. In one instance the later ventricle was filled with blood, and in two others subdural accumulation of blood was found. Of this latter group of eight, glioma was present twice.

From the above study it would seem that hæmorrhage remaining confined to the tumour is more common in glioma, and hæmorrhage arising from the tumour and extending to a considerable distance, or occurring independently of the tumour, was more frequent in other tumours.

I wish to acknowledge my indebtedness to Dr William G. Spiller for placing at my disposal this wealth of material, and for the many helpful suggestions in the preparation of this paper. The tumours were collected from his service, from the services of Dr Mills and Dr Frazier, and other sources.

BIBLIOGRAPHY.

[1] WEISENBURG. "Tumours of the Cerebellum."
[2] TOOTH. *Brain*, 1912-13, xxxv., p. 61.
[3] CUSHING. *Journ. Amer. Med. Assoc.*, 1915, xiv., p. 198.
[4] BYRNES. *Journ. of Nerv. and Ment. Dis.*, March 1909, p. 129.
[5] COUNCILMAN. *Long Island Med. Journ.*, 1914, viii., p. 401.
[6] CUSHING and WEED. *Journ. Med. Research*, 1914.
[7] SPILLER. *Journ. Amer. Med. Assoc.*, Feb. 17, 1912, p. 473.
[8] WEISENBURG. *Brain*, 1910, xxxiii., p. 236.
[9] POLLOCK. *Journ. Amer. Med. Assoc.*, June 5, 1915, xliv., p. 1903.
[10] HALL. *Lancet*, Jan. 11, 1913, p. 89.
[11] SPILLER. *Amer. Journ. Med. Sci.*, July 1903.
[12] COUNCILMAN. *Colorado Med. Journ.*, xii., 1915.
[13] STEWART and HOLMES. *Brain*, 1914, xxvii., p. 523.
[14] SPILLER. *Amer. Journ. Med. Sci.*, 1914, No. 1, cxvii., p. 29.
[15] SPILLER. *Brain*, Sept. 11, 1911.

Abstracts

ANATOMY.

THE EFFECT OF ACTIVITY ON THE HISTOLOGICAL STRUC-
(612) **TURE OF NERVE CELLS.** R. A. KOCHER, *Journ. Comp. Neurol.*, 1916, xxvi., June, p. 356.

THE effect of various grades of activity on nerve cells was studied in a series of fifteen separate experiments. The animals used were dogs, cats, pigeons, sparrows, frogs, and rats. Every experiment was carefully controlled by a resting animal of the same species, of the same approximate age and size, and the material from both given identical treatment, except for the activity. The nerve cells studied were from the cruciate gyrus, from the cerebellum, from the anterior horn of the spinal cord, and from the dorsal ganglia. In one of the experiments over thirty-five hundred nerve cells classified into thirteen types according to histological characters were counted to determine the relative frequency of characteristics which might be correlated with grades of activity. There was no deviation from the normal in even the most advanced fatigue. Over a thousand cells and nuclei were measured by computing the areas of the projected outlines with the planimeter. There was found to be no constant difference

in size of cells or nuclei resulting from activity. Furthermore, no qualitative differences in histological characters could be found between fatigue and resting nerve cells. A. NINIAN BRUCE.

THE STRUCTURE OF THE THIRD, FOURTH, FIFTH, SIXTH, NINTH, ELEVENTH, AND TWELFTH CRANIAL NERVES.
(613) SUMNER L. KOCH, *Journ. of Comp. Neurol.*, 1916, xxvi., Oct., p. 541.

A HISTOLOGICAL study, mainly by Ranson's pyridine-silver technique, of the oculomotor, trochlear, trigeminal, and abducens nerves of dog and man; and of the glossopharyngeal, accessory, and hypoglossal nerves of dog, cat, and rabbit.

Conclusions:—1. Unmyelinated fibres are present in the fifth, sixth, ninth, eleventh, and twelfth cranial nerves. Those in the sixth, eleventh, and twelfth are probably all derived from the sympathetic system. In these nerves they have an arrangement characteristic of sympathetic fibres; they are grouped in clusters, and are most numerous near the periphery of the nerve.

2. The oculomotor and trochlear nerves are strikingly similar in composition; they are composed of large and small myelinated fibres, without any accessions of unmyelinated fibres from the sympathetic system.

3. The abducens is similar to the third and fourth nerves as regards its myelinated fibres, but in addition receives a large number of unmyelinated fibres from the sympathetic system, some of which enter the nerve sheath and travel distalward with the myelinated fibres.

4. The accessory and hypoglossal nerves are composed of large and small myelinated fibres, and are similar in appearance and structure to the third and fourth nerves. Like the sixth nerve, they receive considerable numbers of unmyelinated fibres from the sympathetic system, which can be followed to the termination of the nerves in the muscles which they supply.

LEONARD J. KIDD.

PHYSIOLOGY.

CUTANEOUS SENSATION AFTER NERVE DIVISION. EDWIN G.
(614) BORING, *Quart. Journ. Exper. Physiol.*, 1916, x., pp. 1-95 (98 figs. and one plate).

(1) SECTION of the anterior branch of the internal cutaneous nerve in the forearm resulted in anæsthesia and hypoæsthesia of a small area of skin on the volar aspect near the wrist and slightly to the ulnar side.

(2) All forms of sensibility tended to return gradually to normal. Recovery was from anæsthesia or hypoæsthesia through decreasing degrees of hypoæsthesia to normal; warmth and cold, however, passed through an intermediate stage of hyperæsthesia.

(3) Pain, pressure, and cold became normal at about the same rate; warmth was relatively very much delayed.

(4) Distribution of sensitivity over the skin was always irregular and patchy.

(5) In initial stages there were two zones of sensory defect; an inner zone of anæsthesia and an outer zone of hypoæsthesia, which shaded off from normal sensitivity at its outer edge to extreme deficiency at its inner boundary.

(6) The course of recovery for the two zones was similar. The outer zone always preceded the inner in recovery, and never showed so extreme a degree of abnormality as the inner.

(7) The regions of sensory loss were approximately the same for all forms of sensibility.

(8) Sensibility returned to the outer parts of the affected region first. There was no evidence that it followed the course of the nerve.

(9) During recovery, warmths and colds were frequently experienced as intense and diffuse. Pressures and pains were often remotely referred. Sometimes remote reference and immediate reference occurred together, and a sensation was felt as "double."

(10) Deep sensibility to pressure and pain was not altered.

(11) Localisation of pressures of 20 gm. and discrimination of two pressures applied at 20 gm. remained unaffected.

(12) No new qualities of sensation were experienced at any time. Many unique experiences were found to be merely unusual combinations of familiar qualities.

(13) The hypothesis of Head and others, which assumes that cutaneous sensibility may be divided into "protopathic" and "epicritic" groups, is open to criticism—(*a*) because it is inconsistent in its evolutionary aspect with the hypothesis of development of other modes of sensation; (*b*) because it cannot replace other hypotheses of cutaneous sensibility, since it is applicable only to a particular group of facts; (*c*) because it is not sufficiently thoroughgoing to constitute a true theoretical formulation; and (*d*) because it indicates generalities which admit of exceptions or are of doubtful status.

(14) A more satisfactory theory is one which assumes that single sensory spots are innervated by more than one nerve fibre, that the multiple innervation is projected upon the central nervous system as multiple excitations which depend for their degree upon

their relative strengths, their separations in the region of projection, and a limitation of the available amount of central energy. Under these conditions, multiple innervation may be effective as summation or as inhibition of the excitations involved. The division of inhibiting fibres may result in hyperæsthesia or in abnormal localisation; the gradual appearance of these forms of abnormality is due to the gradual effect of practice in the assumption of vicarious function. A. NINIAN BRUCE.

SOME UNUSUAL EXPERIMENTAL LESIONS OF THE CERE-
(615) **BELLUM AND MEDULLA OBLONGATA.** J. GORDON WILSON and F. H. PIKE, *Amer. Journ. of Physiol.*, 1916, xli., Nov., p. 571.

IN the course of some experiments on the semicircular canals and the otic labyrinth of dogs the following unusual lesions of the cerebellum and oblongata were accidentally made by the writers:—

I. Death from hæmorrhage following intracranial rupture of the posterior meningeal artery.

In these cases death occurred within twenty-four hours: previous experiments had shown that extracranial rupture of this artery had no noticeable effect. The fatal cases alluded to occurred in the course of attempted intracranial section of the vestibular nerve: some of the animals were found dead next morning, irrespective of the success or failure of the attempt at section. Necropsy revealed in each case an extensive hæmorrhage outside the dura, extending backward and downward along the medulla oblongata: the pressure on the bulb is regarded as the cause of death. "Avoidance of the posterior meningeal artery or ligaturing it outside of the skull ended the trouble." The surgical interest of these accidents is discussed.

II. A foreign body in the left lateral lobe of the cerebellum.

In one of these experiments the point of a probe was broken off in the wound in the bone resulting from removal of the labyrinth: it slipped through into the cerebellar cavity. After operation there was marked bilateral nystagmus, which appeared first on side of operation (left), and disappeared on the fifth day. On the seventh day there was (1) marked inclination of head to left, (2) corkscrew twist of head in cervical region, (3) on being lifted up a marked tendency to fall to left, (4) when walking, dog inclines to left and tends to go in small circles, (5) drop reflex little affected, (6) goes upstairs, but refuses to come down; if

induced to do so, falls to left immediately. Necropsy :—Broken off piece of probe embedded in left cerebellar lobe : no hæmorrhage, no adhesion of dura to cerebellum.

III. Lesion of left flocculus cerebelli without injury to vestibular nerve.

A slight lesion of left flocculus, without eighth nerve involvement, did not cause nystagmus, torsion of head, nor rolling over to one side. Dog lay on left side, with left fore and hind limbs extended and right legs often drawn up to the body, head outstretched, nose on floor. When placed on right side, tried to stand up, and fell over to left. Left eye deviated outwards ; left nictitating membrane drawn to median line. Oscillations of this eye occurred, but no constant movement could be made out. Right eye not deviated ; no prominence of its nictitating membrane. After six weeks dog became playful, walked, ran on icy walks, jumped easily over his lead rope. There was a slight tendency to fall to left up to eight weeks after operation, when dog was sacrificed. "The undoubtedly greater persistence of disturbances of locomotion and equilibrium, and the more enduring deviation of the eye, together with the fact that the homolateral eye alone was deviated, differentiate this lesion from a labyrinthine lesion. The fact that this dog lay preferably on the injured side is in direct contrast to the fact that a dog with a more extensive lesion, involving the lateral half of the cerebellum, lay preferably on the uninjured side."

IV. Lesion of the medullary-pontine angle on the left side.

Unilateral rotatory nystagmus, loss of locomotor control, inability to stand, loss of corneal reflex on the side of the lesion, and a tendency to lie on the injured side, were observed in a dog with a lesion at the medullary-pontine angle, involving the seventh but sparing the ninth and twelfth cranial nerves. Necropsy showed hæmorrhage in pontine and medullary region, and a large wound in the medullary-pontine angle involving the facial nerve. LEONARD J. KIDD.

STUDIES ON THE PINEAL GLAND. (Studi sulla ghiandola pineale.) (616) G. BIONDI, *Riv. ital. di Neurop., Psichiatr. ed Elettroter.*, 1916, ix., pp. 251-258, 269-300, 303-321.

BIONDI discusses the subject under the following three headings :—

I. The supposed nerve cells in the human pineal gland.

II. The neuroglia and connective tissue — the general characters of the parenchyma.

III. The secretory phenomena and the lipoids—the results of Goldmann's vital coloration.

His conclusions are as follows:—The pineal parenchyma is constituted by two large classes of cells, some stainable by Cajal's sublimate gold-chloride method, which are undoubtedly of the nature of neuroglia, and others, forming the great majority, which cannot be stained by this method.

Whether the name of neuroglia cells should be given to this second group of cells depend son what is understood by the term neuroglia. If the concept of neuroglia is not limited to the astrocytes alone, but if it is made to include all the non-nervous ectodermic cells originating from the embryonic elements of the neural tube, and contained within the framework of nervous tissue (whether stainable or not by Cajal's) method, the cells in question may be called neuroglia, if it be realised that they differ not only from the astrocytes, but also from the neuroglia of protoplasmic types in the nervous cells.

Cajal's method yields interesting results inasmuch as it permits a clear distinction between these two larger groups of non-nervous ectodermic cells in the pineal gland.

As regards the other groups of cells individualised by authors, Biondi states that the eosinophil cells of Galasescu and Urecchia do not deserve the importance attributed to them. The cells with basophil granules are only mast cells or cells resembling them.

Histological investigation shows that the pineal body is a glandular organ, some of the secretory process being demonstrable by Goldmann's vital coloration method.

Inasmuch as involution phenomena may be found in the pineal glands of individuals in advanced life (*e.g.*, cyst formation and areas of neuroglia surrounded by numerous cells containing products of lipoid degeneration), it is reasonable to maintain that the pineal gland does not cease to be a secreting organ even in advanced life.

As regards the function of the pineal secretion, histological investigators can naturally say very little. In face of the theory maintained by Krabbe (*v. Review*, 1915, xiii., p. 303) and a few others, that the pineal gland serves to regulate the secretion of the cerebro-spinal fluid and the intracranial pressure, there is the other view which attributes a more important action to the pineal secretion, viz., an action controlling bodily growth, genital development, and sexual characteristics in the period preceding puberty, while in the subsequent period its action is quite unknown. The latter theory is supported by experimental physio-pathology, while the former theory can only be regarded as a pure hypothesis.

J. D. ROLLESTON.

CLINICAL NEUROLOGY.

LEFT DORSO-LUMBAR TRANSVERSE SPINAL SCLEROSIS,
(617) **POST-TRAUMATIC. CURABLE TYPE. (Sclérose médullaire, transverse, segmentaire, dorso-lumbaire gauche, métatraumatique. Forme clinique curable.)** REVILLIOD, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 307.

IT is to be regretted that Professor Revilliod has not chosen another title for his paper, for it gives the subsequent history of a case thus described by him in 1905, which has turned out in the end to be a remarkable case of intradural spinal tumour, and the record is of great value.

The symptoms of compression paraplegia began in 1901 and continued for three years. At first the clinical aspect was that of a Brown-Séquard paralysis. By 1904 the symptoms had begun to improve, and in 1905 they had disappeared entirely. Towards the end of that year they reappeared in a rather different form, but by 1906 they had once more improved. About 1912-13 they reappeared again, and progressed rather rapidly to complete paraplegia, with œdema of the lower extremities and sacral bed sores. The patient died on 26th April 1914. Pathologically, an extramedullary intradural tumour was found at the level of the 9th and 10th dorsal vertebræ. It was very hard, and its measurements were some $16 \times 10 \times 13$ millimetres. It had grown from left to right, and had almost completely destroyed the cord.

Professor Revilliod has published an excellent example of an unusual type of spinal tumour, characterised by spontaneous remissions, and his discussion of the case is illuminating.

S. A. K. WILSON.

NEW CONTRIBUTION ON THE EXISTENCE OF ANÆSTHESIA
(618) **OR ANÆSTHESIA WITH LOCAL HYPERTHERMIA IN TABETIC ARTHROPATHY. (Nouvelle contribution a l'étude de l'existence d'anesthésie ou d'anesthésie et d'hyperthermie locales dans l'arthropathie tabétique.)** G. MARINESCO, *Réunion Biol. de Bucarest*, 9 Juin 1916 (*Compt. Rend. Soc. de Biol.*, 1916, lxxix., Oct. 21, p. 877).

MARINESCO has previously shown that in tabetic arthropathy there is constantly present a local hyperthermia and a vibration-anæsthesia in the bony extremities of the affected joint (*v. Review*, 1915, xiii., p. 33). He adds four new observations:—the pall-anæsthesia is exceptionally absent, viz., in one case out of twenty-five. He says he can affirm that there is no true tabetic arthropathy without local hyperthermia. As to the origin of this

hyperthermia, we must connect it with vascular reactions and nutritive exchanges in the region of the affected joint. "But what is the cause of these reactions?" he asks.

LEONARD J. KIDD.

CLINICAL CONTRIBUTION TO THE QUESTION OF A CORTICAL
(619) **CENTRE FOR WINKING. (Contribution clinique a la détermination d'un centre cortical du clignement.)** G. MARINESCO and A. RADOVICI, *Réunion Biol. de Bucarest*, 3 Mai 1916 (*Compt. Rend. Soc. de Biol.*, 1916, lxxix., Oct. 21, p. 869.)

A WOMAN of 27 showed all the classical symptoms of amyotrophic lateral sclerosis with bulbar symptoms. She could not close her eyelids to order; but the "menace" test by the finger or a lighted match in front of the eyes evoked winking immediately. The writers discuss the results of experimental stimulation of the Rolandic and occipital cortex respectively, and conclude that the fact of the association of abolition of voluntary closure of the eyelids, with preservation of the motor reflex for visual impulses, favours the existence of a second centre for the movements of the orbicularis oculi. As, owing to the pyramidal degeneration in their case, the Rolandic motor centre was paralysed, one must postulate a second centre for the reflexion of visual impressions: its seat must be placed in the occipital cortex, close to the calcarine fissure. LEONARD J. KIDD.

ON THE CHANGES IN THE MUSCULAR CONTRACTION IN
(620) **THOMSEN'S DISEASE. (Sul diverso comportamento della contrazione muscolare nel morbo di Thomsen.)** S. RICCA, *Riv. ital. di Neurop., Psichiatr. ed Elettroter.*, 1916, ix., p. 322.

THE writer records a case of Thomsen's disease presenting the following noteworthy features:—

1. The muscular contractions obtained by mechanical stimulation of the tendons or bones are rapid, as in a normal individual. As regards the intensity of the contraction, the reflexes are to be regarded as moderate.

2. By stimulating both nerves and muscles alike with faradic currents of moderate intensity, a rapid contraction (of normal type) results if the stimulus lasts a very short time. If the faradic current is stronger (whatever the time of the stimulus) the muscular contraction always has myotonic characters.

Similar results are obtained with galvanic stimulation, but are less clear and demonstrative. J. D. ROLLESTON.

TWO CASES OF FAMILIAL NEUROFIBROMATOSIS, ONE WITH
(621) **UNILATERAL CHEIROMEGALY. (Deux cas de neurofibromatose familiale dont un avec cheiromégalie unilaterale.)** ROUBINOVITCH and DE LA SOUDIÈRE, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 327.

A BRIEF description of two cases of Recklinghausen's disease. The authors suppose the cheiromegaly to be of the same origin as the other condition. S. A. K. WILSON.

TWO CASES OF ARAN-DUCHENNE AMYOTROPHY OF
(622) **SYPHILITIC ORIGIN. (Deux cas d'amyotrophie progressive, type Aran-Duchenne, d'origine syphilitique.)** SOUQUES, BAUDOUIN, and LANTUÉJOUL, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 297.

THE authors describe only the clinical aspect of two cases of progressive muscular atrophy, in one of which they made the pathological diagnosis of diffuse pseudo-systematised syphilitic meningo-myelitis; the other case was a tabetic. Clinically, the amyotrophy was typically of the Aran-Duchenne variety.

It is useful to have fresh clinical instances of the syphilitic origin of certain forms of progressive muscular atrophy, but in the absence of precise pathological descriptions any hypothesis as to the nature or pathogenesis of the condition is more or less conjectural. S. A. K. WILSON.

THE NATURE, MANNER OF CONVEYANCE, AND MEANS OF
(623) **PREVENTION OF INFANTILE PARALYSIS.** SIMON FLEXNER, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 562; *Pediatrics*, 1916, xxviii., Aug., p. 341.

INFANTILE paralysis is an infectious and communicable disease caused by the invasion of the central nervous system by a minute, filterable micro-organism which has now been secured in artificial culture, and as such is distinctly visible under the higher powers of the microscope. This micro-organism exists constantly in the central nervous organs and upon the mucous membrane of the nose and throat, and of the intestines in persons suffering from the disease, but has not been detected in the circulating blood. The virus, when injected into monkeys, results in the development of a disease corresponding to infantile paralysis in man, and it has thus been proved that the mucous membranes of the nose and throat of healthy persons in intimate contact with acute cases may become contaminated with the virus and infect other people, although they do not develop the disease themselves. The virus

escapes from the body of an infected individual in the secretions of the throat, nose, and, if swallowed, in the intestines. It enters the body also by way of the mucous membrane of the nose and throat, and reaches the nervous system by the lymphatics. The virus is not easily destroyed by temperature or weak chemicals, although exposure to sunlight is fatal. Insects do not seem to be active carriers of the virus, but may be mechanical carriers.

The usual period of incubation does not exceed eight days, but may vary from two days to two weeks or longer. The danger of infection is greatest during the very early and acute stages of the disease. The virus does not tend to persist in the body longer than four or five weeks, and cases kept under supervision for six weeks from the onset of the symptoms may be regarded as free from danger of infection. One attack almost always confers immunity, due to the formation of immune bodies in the blood. Serum obtained from recovered and protected monkeys has been found of value in treatment, but no other animal seems capable of yielding an immune serum, and the monkey is not a practicable animal from which to obtain supplies. The only drug of any use is hexamethylenamin. The tendency of the disease is towards recovery, and it is only when the paralysis involves portions of the brain and spinal cord that control respiration and the heart's action that death results. The average death-rate of many epidemics is below 10 per cent. A. NINIAN BRUCE.

ACUTE POLIOMYELITIS. The Clinical Types of the Disease.
(624) HENRY KOPLIK, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 575.

THE sporadic cases always precede by months the epidemic outbreak. The epidemic in New York in 1907 comprised 886 classified cases, of whom 571 were below 3 years of age, and 77 under 1 year of age.

Four types can be recognised :—(1) The abortive, probably from a scientific epidemiological standpoint, the most important type of the disease; (2) the bulbo-spinal type of the disease; (3) the cerebral and meningeal types; and (4) the bulbo-pontine type. (Wickman also distinguishes a neuritic type.)

It is the abortive type that does not develop paralytic symptoms who spread the disease. Wickman estimates the abortive cases at 35 to 56 per cent. of the whole number, and Müller at 50 per cent. Fever, headache, vomiting, slight rigidity of the neck, and increased or diminished knee jerks in an epidemic must always be regarded with suspicion. The spinal or bulbo-spinal type is the most common and simple type. As a rule, after the tenth day a paralysis is not apt to spread to the bulbar medulla. The meningitic and cerebral

type give rise to a picture closely simulating meningitis. Possibly the spastic hemiplegia of Strumpel should be known as the cerebral or encephalitic type of poliomyelitis. The bulbar or pontine type is characterised by involvement of the facial and other cranial nuclei. A. NINIAN BRUCE.

ABORTIVE AND NON-PARALYTIC CASES OF POLIOMYELITIS—
(625) **THEIR IMPORTANCE AND THEIR RECOGNITION.** GEORGE DRAPER, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 590.

ACUTE anterior poliomyelitis is a general infection with a great variety of manifestations. The cases that have hitherto been called "abortive" should be called "atypical," if we consider those that develop paralyses as typical. The number of cases of this type is considerable.

Five types may be recognised:—(1) Gastro-intestinal; (2) respiratory, with the symptoms of influenza, cough, lung signs, and pains in the bones and joints; (3) febrile; (4) a type characterised by symptoms of meningismus; (5) the type in which paralysis occurs. In the first four types there may be slight transient paralyses. In the type showing paralysis any or all of the symptoms of the other types may be present as prodromal symptoms. In suspicious cases lumbar puncture should be performed. There is usually an increase in the lymphocytes and a very large percentage of polymorphonuclears, which are replaced within twelve to twenty-four hours by mononuclears. In three or four days there is a pure lymphocytosis. The albumin and globulin content of the fluid are increased, but less than in tuberculous meningitis. The anterior spinal flexion sign is important in diagnosis. It is elicited by flexing the trunk forward, doubling the child anteriorly so that head and hips approach. It is definitely present before paralysis sets in, and is probably responsible for the stiff neck and Kernig's phenomenon.

A. NINIAN BRUCE.

THE PRESENT EPIDEMIC OF POLIOMYELITIS—THE TYPE
(626) **WHICH IT PRESENTS.** LOUIS C. AGER, *Archives of Ped.*, 1916, xxxiii., Aug., p. 592.

THE writer distinguishes three types—the encephalitic, the myelitic, and the meningitic. In a group of 64 cases the lower extremities were involved in 39 instances, in 7 the upper extremities, in 5 there was facial paralysis, and in 13 cases the only definite symptom was marked paralysis of the muscles of the back. There were 2 typical ataxic cases. A case of respiratory

paralysis alone, a case of respiratory paralysis with general paralysis, and a case with active maniacal delirium are referred to.

A. NINIAN BRUCE.

THE IMPORTANCE OF THE PRESENT EPIDEMIC OF POLIO-
(627) **MYELITIS.** HAVEN EMERSON, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 584.

THE importance of this epidemic of 1916 lies in the fact that it is the first time in New York City that compulsory notification, isolation in hospital or sanitary homes, placarding of homes, and quarantine of exposed children of the family for two weeks, and of the patient for eight weeks, had been attempted. During this epidemic 2,824 true cases had been discovered up to 23rd July, and of these 579 died, *i.e.*, 20·5 per cent. It is estimated that the case fatality of the 1907 epidemic was 5 per cent.

A. NINIAN BRUCE.

SERUM TREATMENT OF POLIOMYELITIS. SIMON FLEXNER,
(879) *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 19, pp. 583 and 584.

IT has been demonstrated by Flexner and Lewis that monkeys that had recovered from an attack of poliomyelitis, induced experimentally, were not subject to successful reinoculation with the virus of the disease. It has since been shown that the blood of human beings who have recovered from the disease contains immunity substances having the power of neutralising the virus of poliomyelitis: the same condition was found to obtain in monkeys actively immunised with the virus. Flexner and Lewis then found that immune monkey and human sera are capable also of preventing the development of poliomyelitis in animals which have received inoculation intracerebrally or intranasally with a potent virus: the therapeutic inoculation was made intraspinally in from eighteen to twenty-four hours after the infection by the virus. To secure the maximal effect of the immune serum, the injection is made intraspinally, for however the virus is introduced into the body, it becomes established in the meninges. Netter first applied these data to the treatment of the disease in man: his results were favourable. He used serum of cases of poliomyelitis in which recovery had taken place as long as thirty years before. The injections were made subdurally as soon as possible after the diagnosis had been made: probably doses ranging from 5 to 20 c.c. will be found suitable. Such an injection should be given several times at twenty-four hour intervals, according to the clinical indications. Care must be taken, of course, that the donor is in a healthy condition.

R. G. BANNERMAN.

IMMUNE HUMAN SERUM IN THE TREATMENT OF ACUTE
(629) **POLIOMYELITIS.** C. W. WELLS, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 21, p. 1211.

REPORTS by various observers on the efficacy of intraspinal injections of immune human serum have been favourable: it is considered, however, that since the lesions in the nervous system are essentially perivascular infiltrations, intravenous injection is indicated. Accordingly the treatment adopted was the injection of large amounts (50 to 100 c.c.) of immune serum from a recovered case of the disease. The donor's blood should be tested for the presence of the Wassermann reaction, and for lysin or agglutinin for the corpuscles of the recipient. To hasten the dissemination of the immune serum, it is advisable to draw some spinal fluid after the intravenous injection. In all cases there was noted improvement after the injection, but in some cases this was only transient. It is important to institute the treatment as soon as possible.

R. G. BANNERMAN.

THE TREATMENT OF THE ACUTE STAGE OF ANTERIOR
(630) **POLIOMYELITIS.** MURRAY H. BASS, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 611.

A SHORT account of treatment of general interest.

A. NINIAN BRUCE.

A NOTE ON THE NECESSITY FOR PROLONGED TREATMENT IN
(631) **CASES OF INFANTILE PARALYSIS.** FRANCIS HERNAMAN-JOHNSON, *Lancet*, 1916, July 29, p. 185 (5 figs.).

A MUSCLE which is chronically overstretched cannot recover. It must be relaxed by means of a suitable splint, a principle which cannot be over-emphasised.

When such a muscle responds moderately well to faradism—or, in more modern terms, to the small or medium capacities of the Lewis Jones instrument—its recovery will be greatly hastened (and in some cases even determined) by daily rhythmical electrical stimulation. The relaxed position must, however, be maintained throughout.

Exercise, whether voluntary or electrically provoked, must never be carried to the point of fatigue. The contraction of a muscle should be not less vigorous—with the same stimulus—at the end of a sitting than at its commencement. It is better that recovery should be delayed by over-caution, than that it should be made impossible by excess of zeal.

A. NINIAN BRUCE.

ORTHOPÆDIC OBSERVATION IN THE TREATMENT OF ANTERIOR POLIOMYELITIS. (632) CHARLTON WALLACE, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 599.

SUBSEQUENT records after a lapse of five or six months from the onset were obtained in 298 cases from the epidemic in New York City in 1907.

The age of onset was as follows:—One year, 30 cases; two years, 129 cases; three years, 77 cases; four years, 36 cases; five years, 9 cases; and after five years, 17 cases. The oldest case was twelve years of age. Of these the lower extremities alone were affected in 228 cases; the upper extremities alone in 22 cases; both upper and lower extremities in 22; complete paralysis, back, &c., in 1; and absolute recoveries took place in 25 (*i.e.*, abortive cases). Most cases occurred in August. During the acute stage absolute rest and immobilisation in plaster-of-Paris dressings is advisable. Five or six years should elapse after an attack of poliomyelitis before any definite operative procedure should be employed, except in cases where contracture exists. Several operative cases are described. A. NINIAN BRUCE.

LABORATORY AIDS IN THE DIAGNOSIS OF POLIOMYELITIS. (633) JOSEPHINE B. NEAL, *Archives of Pediat.*, 1916, xxxiii., Aug., p. 595.

A SPINAL fluid increased in amount and showing a slight to moderate increase in albumin and globulin, a good reduction of Fehling's solution, and a varying cellular increase, mostly mononuclear, makes the diagnosis reasonably certain in fairly early cases of suspected poliomyelitis. A slightly cloudy fluid, occurring very early in the disease, must be differentiated from a similar fluid in an early purulent meningitis. Fluids from the cerebral or encephalitic type of poliomyelitis sometimes may be differentiated from fluids of tuberculous meningitis only by animal inoculation. A. NINIAN BRUCE.

THE ETIOLOGY OF EPIDEMIC POLIOMYELITIS. (634) E. C. ROSENOW, E. B. TOWNE, and G. W. WHEELER, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 21, p. 1202 (6 figs.).

AN examination of the throats, tonsils, blood, central nervous system and other tissues in cases of this disease has been carried out. The organism encountered was a streptococcus. It is remarkably polymorphous, and appears to vary in size according to the medium in use: this is the case even after passage through a Berkefeld filter. Using the organism in its large form, paralysis has been consistently produced in animals insusceptible

to inoculation with material from epidemic poliomyelitis as hitherto practised, *e.g.*, rabbits. "It appears to us that the small, filterable organism which has been generally accepted as the cause of poliomyelitis may be the form which this streptococcus tends to take under anaerobic conditions in the central nervous system and in suitable culture mediums, while the larger and more typically streptococcic forms, which investigators have considered contaminations, may be the identical organism grown larger under suitable conditions." The organism was obtained from the ventricular fluid after death, and from the blood during life in one instance, but not from the spinal fluid. It was obtained by culture from the brain and cord in each of twelve cases, post mortem; the media used contained ascitic fluid. Paralysis with lesions in the central nervous system has been produced in guinea-pigs, rabbits, dogs, cats, and monkeys, by intravenous or intracerebral injection with this streptococcus from practically all of fifty-two cases of acute poliomyelitis. The organism has been isolated in pure culture from the lesions. The morbid anatomy in these animals included congestion, hæmorrhages, degeneration of nerve cells, some round-celled infiltration and neurophagocytosis in the nervous tissues. R. G. BANNERMAN.

EXPERIMENTAL STUDIES IN THE ETIOLOGY OF ACUTE
(635) **EPIDEMIC POLIOMYELITIS.** J. W. NUZUM and M. HERZOG, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 21, p. 1205 (4 figs.).

FROM cultures of the brain and spinal cord from nine cases dead of the disease, a Gram-positive micrococcus was obtained: culture was more rapid in aerobic conditions than in anaerobic: the media used contained ascitic fluid: the organism presents essentially a diplococcus arrangement; under certain conditions the organism is found to be a minute micrococcus: when once a growth has been obtained, the organism grows readily on the ordinary media by subculture. From the cerebro-spinal fluid of eight out of nine cases, the same Gram-positive diplococcus in pairs and in short chains has been isolated in pure culture: such a culture, injected intraperitoneally in animals, has been found to give rise to clinical and microscopical features which characterise acute poliomyelitis: the animals used were dogs and rabbits. Anaerobic cultures in fluid media were passed through Berkefeld filters: the filtrate produced on suitable media a growth of the larger form of the organism seen in aerobic cultures: the organism has been found to remain viable after thirty-five days' exposure to 50 per cent. glycerin. R. G. BANNERMAN.

TREATMENT OF MENINGITIS. WALTER BROADBENT, *Brit. Med.* (636) *Journ.*, 1916, Oct. 28, p. 586.

FOUR cases are described, two of pneumococcal meningitis, one of streptococcal meningitis, and one of cerebro-spinal meningitis. The first two cases recovered with Pane's antipneumococcal serum and urotropin; the third case began with throat infection, followed by swelling of the temporal and orbital regions, and proved fatal. Flexner's serum and urotropin were given in the last case.

A. NINIAN BRUCE.

MOTOR DISTURBANCES IN TWO CASES OF BILATERAL
(637) **LESION OF THE CORPUS STRIATUM. (Sur les troubles des mouvements actifs dans deux cas de lésion bilatérale du corps strié.)** W. VAN WOERKOM, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 273.

THE author describes at some length two cases of disturbance of voluntary movement associated with atrophy of the corpus striatum. Both corpora were profoundly atrophic; the corpus Luysii was reduced to half the normal size on each side; at the "perforated spots" there was marked proliferation of the neuroglia. No change was found in cerebral or cerebellar cortex. Clinically, the movements resembled both those of choreo-athetosis and of Parkinson's disease.

The paper is a useful contribution to the subject of the pathology of involuntary movements. The author refers to the work of the reviewer on the question at issue, as also to that of others, but the references to the literature are, speaking generally, scanty and very incomplete.

S. A. K. WILSON.

A CASE OF PROLONGED HYPERPYREXIA IN A CHILD WITH
(638) **A MID-BRAIN TUMOUR.** C. VIOLET TURNER, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 261.

THE patient was a female infant, aged 18 months, who was admitted to hospital for stiffness and unconsciousness. The temperature was irregular and intermittent throughout the illness, which lasted about three months, but showed the greatest variations during a period of ten days, during which it would rise once or twice every twenty-four hours to 105°, 106°, or 107° F., and then rapidly fall to normal. The maximum temperature was reached eighteen days before death, when it was 109° F. in the axilla, and 111° F. in the rectum. The autopsy showed a solid rounded tumour in the mid-line, in the region of the corpora quadrigemina, pressing forward into the aqueduct

of Sylvius, with resulting distension of the third and lateral ventricles. Microscopically it consisted of round cells, uniform in size, with but little intercellular matrix. In parts the growth had undergone cystic degeneration. J. D. ROLLESTON.

A FURTHER NOTE ON THE DIAGNOSTIC VALUE OF RETRO-
(639) **BULBAR NEURITIS IN EXPANDING LESIONS OF THE FRONTAL LOBES. With a report of this syndrome in a case of aneurysm of the right internal carotid artery.** FOSTER KENNEDY, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1361.

THE syndrome of a true retrobulbar neuritis, with the formation of a central scotoma and primary optic atrophy on the side of the lesion, together (if pressure be sufficiently great) with ipsolateral anosmia and papillœdema in the opposite eye, is of value in the diagnosis of pressure-producing lesions of the inferior frontal area.

The mode of production of this syndrome is seen in the following case:—

A woman, aged 53, complained of blindness in the right eye and decrease of vision in the left eye. In September 1915 the sight of the right eye became dim, and examination showed an enlargement of the right blind spot, and, later, the definite formation of a small central scotoma complete for form, and a larger scotoma encircling the other complete only for colour. Two months later the patient was only able to see moving objects in the periphery of the right visual field. An exploration of the sinuses proved negative. The pupil reacted to light quickly, but with small amplitude, and then speedily rebounded although the amount of light remained constant; this phenomenon has been called the "retrobulbar pupillary reaction," as it occurs exclusively in conjunction with retrobulbar neuritis.

In February 1916 dimness of the left eye set in with enlargement of the blind spot, followed by a central scotoma. Smell was unaffected on either side. Slight left hemiparesis was later observed. Operation showed a gelatinous-looking tissue thought to be a glioma and a successful decompression was performed. At the autopsy eleven weeks later a ruptured aneurysm of the right internal carotid artery about the size of a walnut was discovered.

A. NINIAN BRUCE.

A CASE OF HYPOPHYSEAL DYSTROPHY. (Un cas de dystrophie
(640) **hypophysaire.)** OBREGIA, URECHIA, and POPEA, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 317.

A FEMALE patient, aged 27. The clinical picture is as follows: Small stature with persistence of the epiphyses, large head,

strabismus, enlargement of the sella turcica, obesity, mental apathy, epilepsy, incontinence of urine, diabetes insipidus, genu valgum, and flat foot. On the other hand, no abnormality of the genital apparatus. The authors regard the case as a "forme fruste" of dystrophia adiposo-genitalis, due to a condition of hypopituitarism. There are useful references to the literature.

S. A. K. WILSON.

PATHOLOGICAL REPORT ON A CASE OF PITUITARY INFANTILISM. (641) J. J. EVANS and E. W. ASSINDER, *Birmingham Med. Review*, 1916, lxxx., p. 1.

THE patient was a man, aged 51, whose clinical history had been described in a previous paper (*v. Review*, 1912, x., p. 38). Post mortem, the pituitary fossa was found to be enlarged, and to contain a hard tumour about the size of a hen's egg. Histologically the tumour showed a firm fibrous capsule, and internally spaces in the fibrous tissues containing red blood cells, and also pigment cells and cells containing pigment. Assinder regarded the tumour as an angioma, which probably originated at the time of an accident at the age of 5 years.

J. D. ROLLESTON.

MYASTHENIA GRAVIS, WITH THYMOMA. (642) W. A. JONES, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1354 (2 figs.).

A MAN, following an exposure to cold while working in water as a ship's carpenter, noticed a marked weakness in his neck muscles a few days later. This increased and was associated with slight pain and soreness in the muscles of the shoulder and the back of the neck, followed by great muscular weakness, inability to close his mouth, to swallow solid food, or to drink liquids. Great emaciation resulted, but after a few weeks improvement set in, and within six months he said he was perfectly well again.

Three years later the above symptoms returned. On examination the weakness was found to involve the entire musculature, although most marked in the neck muscles. The Wassermann reaction was negative. The blood count was normal. He died about ten months later.

At the autopsy no abnormality could be discovered except an enlarged thymus, 6 cm. long, 3·5 cm. deep, and 4 cm. thick. It weighed 60 gm. Microscopically the tissue corresponded to the fœtal thymus at the stage when the epithelial organ is transformed into a lymphoid organ. A few pieces of the sterno-mastoid and sterno-hyoid which were examined showed no lymphorrhages.

Of fifty-six cases recorded since 1901, seventeen showed persistence of the thymus and ten showed a thymic tumour; all the thymic tumours were benign except in one case.

A. NINIAN BRUCE.

EXPERIMENTAL STUDIES OF INJECTION OF THE GASSERIAN GANGLION CONTROLLED BY FLUOROSCOPY. LEWIS J. POLLOCK and HOLLIS E. POTTER, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1357 (4 figs.).

(643)

THE writers describe certain modifications of Härtel's original method for injecting the Gasserian ganglion. The localisation of the Eustachian tube is easily accomplished by passing a Eustachian catheter and it thus becomes easy to determine when the needle through which the injection is to be made lies in front, above and external to the Eustachian tube at a proper depth. The shadow cast by the anterior border of the petrous portion of the temporal bone on a fluoroscope can be used as a line of orientation.

A. NINIAN BRUCE.

FREQUENCY OF HEREDITARY SYPHILIS. F. S. CHURCHILL and R. S. AUSTIN, *Amer. Journ. Dis. Child.*, 1916, xii., Oct., pp. 355-363.

(644)

INTENSIVE study of a group of 695 patients in the Children's Memorial Hospital during the winter of 1915-1916, the study embracing both clinical and laboratory methods of investigation, shows an incidence of 3·3 per cent. of hereditary syphilis.

The amount of hereditary syphilis among the hospital infants and children in four large cities of the United States—New York, St Louis, San Francisco, and Chicago—appears to range from 2 to 6 per cent.

A. NINIAN BRUCE.

THE LUETIN REACTION IN SYPHILIS. WILLIAM FLETCHER, *Lancet*, 1916, cxci., Oct. 21, p. 710.

(645)

NOGUCHI'S luetin consists of killed cultures of the *Treponema pallidum* emulsified with the media in which they have been cultivated.

The results of the luetin test in 130 cases of syphilis in the Federated Malay States, mostly Chinese of the coolie class, were not found to be so frequently positive as in the cases examined by Noguchi and other observers in America. Possibly the sample of luetin had deteriorated from storage. No positive reactions were obtained in persons free from syphilis. A positive reaction is thus of great significance, but a negative result does not exclude

syphilis. When performed in conjunction with the Wassermann reaction, the luetin test is of great value; in the early stages of syphilis the Wassermann reaction, and in the later stages the luetin reaction, is more constantly positive. Both reactions may be negative, however, and syphilis be present.

A. NINIAN BRUCE.

A COMPARATIVE STUDY OF THE LUETIN AND WASSERMANN REACTIONS IN INFANCY AND CHILDHOOD. (646) L. R. DE BUYS and J. A. LANFORD, *Amer. Journ. Dis. Child.*, 1916, xii., Oct., pp. 387-394.

THE Wassermann reaction is not so valuable as the luetin test in cases of hereditary syphilis. It is impossible for a mother to give birth to a child who gives positive laboratory tests for congenital syphilis without herself giving positive tests. While the luetin test is of more value than the Wassermann reaction, it should not displace the latter, as both tests serve distinct purposes, the Wassermann to give evidence of the presence of antibodies in the circulation, indicating an active process; while the luetin not only gives this evidence, but also indicates an existing syphilitic condition, even though it be inactive.

The luetin test has the disadvantage that it requires considerable experience in differentiating the lesion from the simple reaction produced by the intradermal injection of sterile inert foreign material. It is also influenced by the administration of certain drugs which give rise to a pseudo-reaction (*v. Review*, 1916, xiv., p. 397). Luetin reactions should not be considered negative until sufficient time shall have elapsed to warrant such a reading.

A. NINIAN BRUCE.

THE ALBUMIN AND GLOBULIN CONTENT OF HUMAN BLOOD SERUM. (647) ALBERT H. ROWE, *Archives Intern. Med.*, 1916, xviii., Oct., p. 472.

A SERIES of normal cases shows that serum albumin varies between 4·6 and 6·7 per cent., that globulin varies between 1·2 and 2·3 per cent., that total proteins vary between 6·5 and 8·2 per cent., that nonproteins vary between 1·1 and 1·3 per cent., while the percentage of globulin in the total protein varies from 16 to 32 per cent. The average value for albumin was found to be 5·6 per cent., for globulin 1·9 per cent., for total protein 7·5 per cent., for nonprotein 1·24 per cent., and for globulin 25·5 per cent.

The normal values for total protein, albumin, and globulin from the entire literature are given, while the literature on these proteins in health and disease as well as on methods of their estimations is summarized.

The former use of the refractometer in medical research is discussed, while the error in Reiss's method for the determination of total proteins is pointed out. It is shown that Robertson's microrefractometric method for the determination of total protein is free from evident error, and for the estimation of albumin and globulin is the most satisfactory method yet proposed.

In syphilis the globulin is definitely increased, while the total protein remains about normal.

In pneumonia the globulin is increased more in relation to the total protein than in syphilis, while the total protein is reduced, due, probably, in large measure to a dilution of blood serum by water retention, which occurs in fever.

In many chronic septic conditions, in mild infections and typhoid, the total protein is not decreased, as it is in pneumonia.

Globulin seems definitely increased in all infections, except in acute tonsillitis, typhoid, and in certain mild infections, such as chronic bronchitis. The marked dilution of serum which occurs with anasarca is shown in two cases of acute infection associated with acute nephritis, which were investigated.

The evidence presented shows that the Wassermann reaction is not due to a quantitative increase in the serum globulins.

A. NINIAN BRUCE.

SUGAR CONTENT OF THE BLOOD AND SPINAL FLUID OF INSANE SUBJECTS. (648) PAUL G. WESTON, *Journ. Med. Research*, 1916, xxxv., Nov., pp. 199-208.

BLOOD and spinal fluid from each of a series of individuals were examined for sugar by the method of Myers and Bailey. The series includes twenty cases of dementia præcox, ten of manic-depressive insanity, twenty of paresis, six of epilepsy, and nine of imbecility. The ratio of sugar found in the spinal fluid to that found in the blood varied from 1 to 1·55 in the epilepsy group, to 1 to 1·72 in the general paralysis group. Individual differences are quite considerable, especially in the dementia præcox group, but the averages for the different groups show no considerable deviation from normal.

A. NINIAN BRUCE.

THE POSSIBLE FUNCTIONS OF THE CEREBRO-SPINAL FLUID. (649) **(Presidential Address before the Neurological Section of the Royal Society of Medicine.)** W. D. HALIBURTON, *Lancet*, 1916, cxci., Nov. 4, p. 779.

THE cerebro-spinal fluid is primarily formed by the secreting cells covering the choroid plexus in the cerebral ventricles, so that this structure may be appropriately designated the choroid gland.

The pressure of the fluid is not the result of arterial pressure passively transmitted to it, although it may be affected by changes in the arterial and venous pressures. The true cerebro-spinal pressure is the result of the secretory pressure of the choroid epithelium cells. This may be increased by excess of carbon dioxide in the blood, volatile anæsthetics which interfere with respiration or alter the physical conditions of secretion, or by extract of the choroid gland or brain. The exit of the fluid is by the blood stream and not by the lymph channels of the nerves. This process is by diffusion, and is most rapid in the sub-cerebellar region and slowest in the lower spinal region. Diffusion from the blood to the cerebro-spinal fluid scarcely occurs. Fluid can also travel along the path of certain cranial nerves, especially the olfactory.

The cerebro-spinal fluid undoubtedly also fulfils certain mechanical functions of support and pressure. It is to be regarded as *the ideal physiological medium*; the trace of protein it contains is probably quite sufficient for nutritive purposes, and is no doubt the kind of protein particularly suited to repair the small amount of wear and tear which is the result of nervous action. The sugar serves for a supply of energy. The choroidal epithelium exercises really a protective function and prevents harmful proteins (toxins), soluble drugs, &c., from passing through.

A. NINIAN BRUCE.

THE VALUE OF VARIOUS DIAGNOSTIC METHODS FOR THE
(650) **CEREBRO-SPINAL FLUID.** H. NAKANO, *Journ. Cut. Dis.*, 1916, xxxiv., March, p. 185.

THE Wassermann reaction in the spinal fluid in late syphilis as well as in cerebro-spinal lues, tabes dorsalis and dementia paralytica rapidly disappears, but the serum reaction remains for a long period.

2. The substance causing the complement fixation in the spinal fluid probably enters the fluid from the blood, but we are not yet able to determine whether the antibody of this reaction is produced in the fluid itself.

3. The Nonne-Apelt reaction frequently appears in the cerebral and spinal disease.

4. The Weil-Kafka reaction appears in acute and chronic inflammations in cerebro-spinal and meningeal diseases (lues, general paralysis, tabes dorsalis, and acute meningitis).

5. The Lange reaction appears in almost all cerebral and spinal diseases. The nature of the Lange reaction is closely connected with the presence of globulin and nucleoprotein in the fluid. It is very difficult to determine the difference between lues and other diseases. But in cases which have been proclaimed to be luetic by

other diagnostic methods, the Lange reaction may be used to determine the early involvement of the nervous system of a syphilitic patient, since it is more sensitive than other reactions.

6. Nonne-Apelt, Wassermann, Weil-Kafka, and Lange reactions disappear by degrees under treatment with salvarsan, mercury, and iodine. A. NINIAN BRUCE.

THE CLINICAL PATHOLOGY OF THE CEREBRO-SPINAL FLUID.
(651) W. BOYD, *Canadian Med. Assoc. Journ.*, 1916, vi., Nov., pp. 984-995.

A GENERAL paper upon this subject.

A lumbar puncture examination may be of value in:—

(1) The diagnosis of meningitis from meningism and cerebral abscess; (2) the recognition, by a bacteriological examination, of the organism causing the meningitis so as to aid the treatment; (3) the detection of meningeal hæmorrhage from fracture of the skull; (4) in the early diagnosis of general paralysis, tabes, and secondary and tertiary syphilis of nervous system; (5) the relief of headache, vomiting, and optic neuritis in cases of intracranial tumour; (6) the relief of symptoms, and in some cases the permanent cure, of acute meningitis; and (7) the lowering of intracranial pressure in uræmic coma and convulsions, and in puerperal eclampsia, when all other methods of treatment have proved of no avail. A. NINIAN BRUCE.

STUDIES OF THE SPINAL FLUID DURING IODIDE MEDICATION BY MOUTH.
(652) JOSEPH H. CATTON, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1369.

IN a series of cases examined, regardless of the amount of iodine administered by mouth, no iodine or compounds of iodine were found in the spinal fluid. Either iodine compounds do not pass the ependymal cells of the choroid plexus in any measurable quantity, or such iodine as does reach the spinal fluid is very rapidly fixed in the tissues. A. NINIAN BRUCE.

PREGNANCY COMPLICATED BY INCREASED CEREBRO-SPINAL PRESSURE. Survival of mother and child.
(653) NORMAN GRAY, *Lancet*, 1916, cxci., Nov. 4, p. 792.

A WOMAN, aged 38, seven and a half months pregnant, developed severe headache, vomiting, marked rigidity of the neck and back, with retraction of the head. Sleep could be induced by heroin and hyoscine. Lumbar puncture on the ninth day gave issue to

over three ounces of clear fluid under great pressure. The fluid was not examined for some time, and then proved sterile. The symptoms improved, and a healthy child was born, followed by a normal puerperium. It is suggested that the influenza bacillus might have been responsible for the increase of pressure.

A. NINIAN BRUCE.

THE PATHOGENESIS OF CERTAIN FORMS OF EPILEPSY.
(654) (**Pathogénie de quelques formes d'épilepsie.**) BOLTEN, *Nouv. Icon. d. l. Salpêt.*, 1914, Sept.-Dec., p. 360.

1. IDIOPATHIC and symptomatic epilepsy cannot always be distinguished, clinically, one from the other. No criterion for differential diagnosis can be discovered in the particularities of the attack itself.

2. Symptomatic epilepsy is produced by various lesions of the meninges, cortex, or subcortical tissues, which, through rise of intracranial pressure or processes of local sclerosis, produce a venous hyperæmia of the cerebral cortex.

3. Idiopathic epilepsy is a chronic auto-intoxication, caused by toxic products of alimentary decomposition, or by toxins of cellular metabolism, which, owing to defective function of the thyroid and parathryoids, are insufficiently neutralised.

4. In both forms of epilepsy the cerebral cortex is slowly saturated with toxins; in the case of symptomatic epilepsy, lymphatic and venous congestion leads to the accumulation of the products of defective metabolism in the particular area involved.

5. The attack is a reaction on the part of the organism to disembarrass itself of toxins.

6. In idiopathic epilepsy a genuine anti-epileptic treatment consists in the rectal administration of fresh extracts of the defectively functioning glands, viz., the thyroid and parathyroids. "Ce traitement suffit pour faire disparaitre pour toujours tous les phénomènes morbides."

It would be very interesting to determine whether the conclusion stated by the author with such confidence and assurance is justified by clinical experience. S. A. K. WILSON.

BLOOD CULTURES IN EPILEPSY WILLIAM B. WHERRY and WADE
(655) W. OLIVER, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1087.

THE authors failed to find the *B. epilepticus* of Reed in six cases of epilepsy, although some of them were the cases referred to by Reed in his original paper. A. NINIAN BRUCE.

A BACTERIOLOGICAL STUDY OF THE BLOOD OF SEVENTY
(656) **EPILEPTICS, with special reference to the *Bacillus epilepticus* of Reed.** H. CARD and D. A. THOM, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1089.

160 BLOOD CULTURES were made in this series of seventy cases, and 156 proved sterile. The remaining four showed contaminations. Four cases with either myoclonus or hemiplegia also gave sterile blood cultures. In a series of seventeen necropsies on epileptics, Dr Canavan, in a bacteriological study, was unable to find any organism resembling *B. epilepticus*. In these seventy epileptic patients it would seem evident that the epileptic syndrome was not due to the *B. epilepticus* of Reed (*v. Review*, 1916, xiv., p. 182).

A. NINIAN BRUCE.

A STUDY OF TWO HUNDRED AND TWENTY-SIX CASES OF
(657) **CHOREA.** I. A. ABT and A. LEVINSON, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1342.

THE frequency of chorea in children treated at the Sarah Morris Hospital for Children was about 2·2 per cent. of all children treated at the hospital. The age incidence ranged from 3½ to 18 years. The ages of most frequent occurrence were between 5 and 14. The ratio of females to males was 2 to 1. The greatest number were observed in December and January, the smallest number in October, but season did not play a constant rôle. The relationship between rheumatism and chorea was not marked; 13 had a definite history of rheumatism and 130 had no history of rheumatism. The authors, however, believe in this relationship although their cases do not bear it out. Tonsillitis was also not a prominent factor. 66 per cent. of the cases had no such history. Infectious diseases were frequently found to precede the onset of chorea, but no close relationship could be discovered. Syphilis was present in two cases. Endocarditis was a frequent but not constant complication. The mortality was a little less than 1 per cent. The duration of the disease varied from one day to more than a year; the average duration was from two to eight weeks. Recurrences occurred thirty-five times; one patient had four recurrences, four had three, and twenty had two recurrences. The method of treatment had no direct bearing on recurrences. Treatment should consist of rest in bed and complete isolation, baths, and salicylates. Arsenic has no special effect on the disease, and in too large doses may be pernicious.

A. NINIAN BRUCE.

EXOPHTHALMIC GOITRE. (The Bradshaw Lecture.) HECTOR (658) MACKENZIE, *Lancet*, 1916, cxci., Nov. 11, p. 815.

DURING the four years, 1911-14, the number of deaths returned in England and Wales as resulting from exophthalmic goitre was 1,558 for females and 155 for males, *i.e.*, 10 females to 1 male. As a rule the symptoms develop gradually after some shock or strain, but cases may arise without any such emotional disturbance. Enlargement of the thymus is not uncommon. The blood usually shows a leucopenia with a relative lymphocytosis; there is no absolute increase in lymphocytes. Wasting is generally an unfavourable symptom.

In regard to treatment, the serum or milk of thyroidectomised sheep or goats is a failure. The serum prepared by Merck and the substance called thyroidectin are quite inert. Rodagen in large doses in wasting cases is good, but probably casein would have the same effect. Six cases are described, all of which benefited considerably from the use of X-rays, and a seventh is added which the application of X-rays converted into myxœdema, and which was later cured by thyroid treatment.

In regard to operative treatment, operation, if done at all, should be performed under local anæsthesia. Ligature of the thyroid arteries does not appear to have any appreciable effect on the disease, and therefore, if done at all, it should only be as a forerunner of thyroidectomy. Thyroidectomy does not cure unless a sufficient amount of gland is removed. If possible, it is better to remove more than an entire lobe at an operation. If a whole lobe is left behind, a second operation is usually necessary later, unless by means of other treatment a sufficient reduction of the remaining lobe can be brought about. A. NINIAN BRUCE.

THE COMMON SPEECH DISORDERS OF CHILDHOOD. J. (659) PRIESTLEY, *Brit. Journ. Child. Dis.*, 1916, xiii., p. 104.

PRIESTLEY divides these into the essential and the accidental. The essential speech disorders are (1) defective or imperfect articulation, (2) stammering.

Defective articulation, which is universal at the age 2 to 4, may persist up to or beyond school life under two types—(1) *en masse* as idioglossia, (2) in particular sounds only—lisping.

In a series of school children examined, about 1·8 showed some defect of speech. J. D. ROLLESTON.

PSYCHIATRY.

SOME CONSIDERATIONS OF GENERAL PARESIS FROM THE
(660) **HISTOLOGICAL STANDPOINT.** SAMUEL T. ORTON, *Amer. Journ. Insan.*, 1916, lxiii., July, p. 89.

A REVIEW of current knowledge in regard to the histology of general paralysis. D. K. HENDERSON.

OUR WORK AS PSYCHIATRISTS AND ITS OPPORTUNITIES.
(661) EDWARD N. BRUSH, *Amer. Journ. Insan.*, 1916, lxxiii., July, p. 1.

IN this, the presidential address of the seventy-second annual meeting of the American Medico-Psychological Association, Dr Brush especially calls for an influx of well-trained, enthusiastic, ambitious young men into the wards of mental hospitals. The need for psychiatric clinics in connection with medical schools, after-care work, and out-patient work are all discussed and advocated. The necessity of arranging retiring allowances for medical superintendents and medical officers is also urged.

D. K. HENDERSON.

STAGE MAD FOLK IN SHAKESPEARE'S DAY. PIERCE BUTLER,
(662) *Amer. Journ. Insan.*, 1916, lxxiii., July, p. 19.

A MOST interesting address, showing how in Elizabethan times the insane were used on the stage for (1) comic effect, and (2) to excite pity or horror. In contrast to that more or less individual view-point it is shown how the modern drama is essentially social, and the consequence is that realistic studies of insanity are refrained from because they could not in any wise help in the solution of the problem of the insane. Scenes from plays by Shakespeare, Middleton and Rowley, Thomas Kyd, Marlowe, and Webster are discussed, and an attempt is made to analyse the view-point of the authors. D. K. HENDERSON.

INTELLECTUAL EFFICIENCY IN RELATION TO INSANITY.
(663) A. J. ROSANOFF, *Amer. Journ. Insan.*, 1916, lxxiii., July, p. 43.

THE lives of William Cowper and Julius Robert Mayer, both of whom showed definite manic-depressive symptoms, and of Gustave Flaubert, who was an epileptic, are discussed.

It is contended that these cases seem to show that grave neuropathic conditions are not incompatible with the highest degree of intellectual efficiency; it seems even in these cases the morbid elements of personality have been among the factors of the high quality of the intellectual products.

"The existence of a neuropathic condition, established by medical diagnosis, can no longer be regarded as sufficient grounds for the advocacy of negative eugenic measures: not insanity, not epilepsy, as such, but mental disablement is the proper concern of eugenics." D. K. HENDERSON.

THE PSYCHIATRIC NEEDS OF A LARGE COMMUNITY. OWEN (664) COPP, *Amer. Journ. Insan.*, 1916, lxxiii., July, p. 79.

THIS paper outlines in an excellent way the ideals to be aimed at in the care and treatment of the insane. It is clearly shown why it is necessary to have hospitals for the care of the acute and curable cases, as well as other hospitals situated preferably in the country for the more incurable cases. The aims of the *Psychiatric Hospital* are thus summarised: the prevention of mental abnormality; its cure or amelioration; scientific research into its nature, causes, and results; diffusion of such knowledge through adequate teaching of psychiatry in medical schools to facilitate early treatment, and through mental clinics to serve the mentally affected within the community, in the schools, before the courts, or in need of charity. In the colony system what is aimed at would be the adjustment of conditions of living, occupation, and diversion to individual need, particularly of long residence patients, so that they may be as nearly normal as mental infirmity permits.

Segregation as a means of protection of the individual, and as a defence of the public, is also recommended.

D. K. HENDERSON.

THE RELATIONSHIP BETWEEN PELVIC DISEASE AND MANIC-
(665) **DEPRESSIVE INSANITY.** GORDON GIBSON, *Amer. Journ. Obstetrics*, 1916, lxxiv., Sept., pp. 439-444.

NO mental improvement may be expected to follow an operation performed on the pelvic organs of a woman who is suffering from a psychosis which is characterised by dementia.

An operation for the correction of lesions in the pelvis is justifiable in a woman who has manic-depressive insanity, and some improvement may be hoped for if the operation is performed in the first or second attack.

The pelvic pathology is not the cause of the psychosis, but may act as the exciting cause of an attack in a woman of neuropathic stock.

The effect of the operation may be an indirect one by improving the general physical condition of the patient.

A. NINIAN BRUCE.

THE EFFECT OF TYPHOID INOCULATION ON ENDEMIC GOITRE AT THE LAWRENCE MILITARY ASYLUM, SANAWAR, PUNJAB. M. A. NICHOLSON, *Lancet*, 1916, Aug. 12, p. 275.
(666)

TYPHOID inoculation had no effect in any way on the course of the endemic goitre in this asylum, either individually or collectively.

A. NINIAN BRUCE.

Reviews

THE DIAGNOSIS OF NERVOUS DISEASES. PURVES STEWART, C.B., M.D., F.R.C.P. Fourth Edition, revised and enlarged. Pp. viii+589, with 383 figs. Edward Arnold, London. 1916. Pr. 18s. net.
(667)

THE present edition of this well-known text-book differs considerably from its predecessors, as, owing to the numerous recent advances in clinical neurology, much new material has had to be incorporated in order to bring it up to date. Many of the portions have thus had to be rewritten, such as those on cerebellar lesions, the neuroses, the vegetative nervous system, the cerebro-spinal fluid, &c., and recent work, such as Bárány's contributions to the diagnosis of labyrinthine troubles, the colloidal gold reaction in the cerebro-spinal fluid in general paralysis, tabes, cerebro-spinal syphilis, and meningitis, &c., has been included. An additional chapter of seventy pages has also been added dealing with organic lesions of the nervous system observed by the author in cases of injury to the brain, spinal cord, and peripheral nerves produced during the present war.

Like the earlier editions, the book is only concerned with diagnosis of nervous disease, and does not occupy itself with treatment. At a time like the present, when the war has produced so much nervous disease, and when the importance is fully realised of the necessity of distinguishing functional from organic lesions before they become firmly established, and their successful treatment rendered correspondingly difficult and unsatisfactory, such a work is of special value. The reputation which the earlier editions have earned for themselves will be still further enhanced by this volume, which gives a practical and concise account of the main facts of present neurological diagnosis unsurpassed by any other modern work. It is extensively illustrated, and the type is pleasant and agreeable to read.

THE DUCTLESS GLANDULAR DISEASES. By WILHELM FALTA, (668) Vienna. Translated and edited by Milton K. Meyers, M.D., Neurologist to the Lebanon Hospital, and to the Dispensaries of the Jewish and St Agnes Hospitals, Philadelphia. With a foreword by Archibald E. Garrod, M.D. (Oxon.), F.R.C.P. (London), F.R.S., Physician to St Bartholomew's Hospital, London. Second Edition, revised. Pp. xix+674, with 101 illustrations. P. Blakiston's Son & Co., Philadelphia. 1916. Cloth, $7·00 net.

THE experimental physiology and pathology of the ductless glands has been dealt with recently by Sir Edward Schäfer (*v. Review*, 1916, xiv., p. 139), and still more exhaustively by Biedl. The present volume is concerned with the clinical aspects of the diseases of these glands.

As Dr Garrod says in his introduction, neither Dr Addison, when he in 1855 first described the syndrome which has ever since borne his name and proved its dependence upon destructive lesions of the adrenal glands, nor his contemporaries, can have formed any conception of the vast extent of the unexplored field into which they had so suddenly entered, nor the importance which this type of disease would later attain. So rapidly has our knowledge of the diseases resulting from disturbance of function of these glands increased during recent years, that the time is ripe for the appearance of some authoritative work upon the clinical aspect of the problem, and this is admirably fulfilled by the present volume.

The book opens with a general introduction. The author considers it is important from the clinical point of view not to associate the meaning of internal secretion exclusively with the ductless glands. "We may designate the totality of all cell-complexes provided with an internal secretion a *hormonopoictic* system. There are, however, a series of organs, the proper function of which we must regard as the production of especially important hormones, which are provided with powerful physiological characteristics. It is a common property of these organs that they separate out their specific secretion directly into the blood-path. We therefore call them ductless glands, and their collective total the ductless glandular system." The ductless glands may be classified into two groups, one an accelerator group (catabolic-dissimilatory) and the other a retardative group (anabolic-assimilatory). The former includes the thyroid, the posterior lobe of the hypophysis, the chromaffin tissue, and the glands of generation; the latter includes the parathyroid, the anterior lobe of the pituitary, the suprarenal cortex, and the interstitial glands. The ductless glands influence the excitability of the vegetative nervous system by their hormones, and also by the fact that they

are supplied by vegetative nerves, through which their function is regulated. The autonomy of the ductless glandular system varies with the different glands, being developed to the greatest degree in the sexual glands, and least in the chromaffin tissue. There is not sufficient evidence for the assumption that poisons normally found in the organism are rendered non-poisonous in the ductless glands, and that they poison the body when the ductless glands are insufficient. We are also not justified in postulating the "dysfunction" of a ductless gland; all their diseases may be explained as exclusively due to quantitative alterations in the secretion. At least seven different pluriglandular syndromes have been described. These are produced through physiological correlation and through functional influence on the part of the vegetative centres. Individuals may be grouped into three classes, according as their ductless glandular system is stabile, debile, or labile.

The different ductless glands are then considered in separate chapters. In regard to the thyroid and exophthalmic goitre "the cause is not as yet explained. Most of the symptoms can be referred to the hyperthyroidism; the cause of the hyperthyroidism is possibly conditioned centrally, and thus perhaps a series of symptoms and alterations in the function of other ductless glands are co-ordinate with the hyperthyroidism." "The manifestations of tetany are the result of insufficiency of the parathyroid glands." The physiological significance of the thymus gland is still not understood, but we ought to separate a status thymicus from a status lymphaticus. The latter appears to possess a close relationship to conditions of hypofunction of the chromaffin tissue. It is impossible, however, to do more than merely mention some of the special chapters, *e.g.*, upon pluriglandular diseases, vegetative disturbances that do not depend directly on diseases of the ductless glands, diseases of the insular apparatus of the pancreas and their relation to diabetes mellitus, and different forms of obesity and adipositas dolorosa, while other diseases not usually associated with the ductless glands are discussed from the point of view of a possible relationship. *e.g.*, chlorosis, dwarfism, mongolism, &c.

The different views held by different writers on the clinical affections of the ductless glands separately and collectively are well summarised here, and present numerous points for further investigation and discussion. Such a work is therefore of great value and to be widely recommended. The extent of the literature may be realised from the fact that sixty-eight pages are necessary for the bibliography alone. There is a good index.

MANUAL OF PSYCHIATRY. J. ROGUES DE FURSAC, M.D., Physician-
(669) in-Chief of the Public Insane Asylums of the Seine Department, and A. J. ROSANOFF, M.D., First Assistant Physician, Kings Park State Hospital, N.Y. Fourth Edition, revised and enlarged. Pp. xi + 522. Chapman & Hall, Ltd., London. 1916. Pr. 10s. 6d. net.

OWING to the war a close co-operation between the French and American authors of this book has been impossible, and it was accordingly agreed to place the preparation of this, the fourth edition, entirely in the hands of the American collaborator.

The manual is divided into two parts. The first part treats of general psychiatry, and comprises a study of the causes, symptoms, treatment, and prevention of mental disorders, considered independently of the affections in which they are encountered. The second part is devoted to special psychiatry, *i.e.*, to the study of the individual psychoses.

In the first part of the book the chapters dealing with etiology, history taking, methods of examination, special diagnostic procedures, general prognosis, prevalence of mental disorders, prevention and medico-legal questions, and in the second part, those dealing with Huntington's chorea, cerebral syphilis, and traumatic psychoses are either wholly new, or almost so. The chapter on general therapeutic indications in the first part of the book, and those on dementia præcox, chronic alcoholism, general paresis, and mental disorders due to organic cerebral affections, in the second part, have all been extensively revised.

When the first French edition was published thirteen years ago, Kraepelin's classification was followed. Here the arrangement of the clinical groups has been changed, and they have been placed in an order as far as possible according to etiology, the main headings being (1) constitutional disorders; (2) alcoholic disorders; (3) syphilitic disorders; (4) traumatic disorders, and (5) miscellaneous groups.

Symptomatology is particularly well discussed; hallucinations, fixed ideas, imperative ideas, disorders of judgment, delusions, automatic actions, impulsive reactions, stereotypy, negativism, &c., are all explained clearly with numerous references to original articles.

As a text-book of psychiatry this manual may be confidently recommended, as it presents to the reader a good and general conception of the modern attitude from which mental disease is coming to be regarded. The chapters on dementia præcox, paranoia, and the manic-depressive psychoses are specially well written, practical, and lucid, and should prove of considerable assistance to those engaged in studying such cases clinically, and who wish a reliable book to which they may refer for an account

of recent views and interpretations of symptoms. Descriptions of typical cases are introduced and help to illustrate the different conditions, while the tendency to group the essential points under separate headings, and arrange them in short schemes is distinctly helpful. A most useful and practical book, which will well repay careful study.

THE MENTALLY DEFECTIVE CHILD. Written specially for
(670) **school teachers and others interested in the educational treatment and after-care of mentally defective school children.** MEREDITH YOUNG, M.D., D.P.H., D.Sc. Pp. xi+140, with 9 figs. H. K. Lewis & Co., Ltd., London. 1916. Pr. 3s. 6d. net.

THIS small book, as its title states, is written specially for the layman, and is based upon a series of short lectures on the medical aspect of the subject delivered by the author to a Special Summer Course of training on this subject for school teachers at Birmingham. A number of points to which attention should be directed in examining a child are first given, after which various types of mental deficiency are described, as well as conditions often associated with it. Special chapters are devoted to the moral imbecile and to the Binet-Simon tests. That these tests are of value in assessing intelligence in years of age is admitted. Whether they afford a means of ascertainment and classification of degrees of mental defect (idiot, imbecile, feeble-minded) is another matter. The tests tend to be too easy at the lower end of the scale and too difficult at the higher end. Very great importance should be attached to the "general concepts" of the child. Examples of ten illustrative cases are given. An important chapter deals with the education of the feeble-minded. This should begin about the fifth year. "The education should be manual, with classes in the 'three R.'s' *for those capable of benefiting by such classes.*" It must be remembered that a defective child has to take his place in the world after attaining the age of 16, unless permanently detained in an institution under the Mental Deficiency Act. Punishment should be graduated according to the mental and not the physical age of the child. The outlook on the whole is not so hopeless as is sometimes represented, but the author thinks there is a tendency to over-estimate the possibilities of education in these cases. "It is safe to say that permanent life-long control is universally agreed as essential to prevent this sadly placed section of the community from becoming a danger alike to the public and to themselves."

HUMAN MOTIVES. JAMES JACKSON PUTNAM, M.D. *Mind and*
(671) *Health Series.* Pp. xvii + 179. William Heinemann, London. Pr. 5s. net.

A STUDY of human motives should prove of interest to most people. According to the author, motives are mainly traceable to the conjoined action of two different and apparently antagonistic sets of tendencies, the one related to our rational aspirations, the other to our emotional repressions. These may be termed motives of constructiveness and motives of adaptation. They may be studied either by the philosophic or by the psycho-analytic method. The purpose of this book is to define these tendencies in such a way as to bring out the contrast between them, and yet show that the differences underlying this contrast are susceptible of being reconciled in a new and rational synthesis. The relation of the individual to the creative energy which underlies the universe is discussed for the purpose of suggesting a rational basis for the religious conceptions which are taken as constituting one source of human motives. Another chapter gives the history in brief of the psycho-analytic movement. The first impulse came from Dr J. Breuer, of Vienna, who, in 1881, happened to treat a case of hysteria in an intelligent young woman suffering from hysteria with paralyses, contractions, and disorders of speech, and in whom the usual means of cure were unsuccessful. With him was associated, as student and assistant, Dr Sigmund Freud, and it was noticed that as the history of many forgotten experiences of an emotional character was gradually recovered, the symptoms correspondingly improved. Freud spent the next ten years maturing his thoughts on these points, and studied during part of this time with Charcot in Paris. He then returned to Vienna and worked with Breuer along these lines, until Breuer withdrew from the work, as it was leading in a direction in which he did not care to go further. The fourth chapter discusses the question whether the psycho-analytic movement is doing anything to prevent the evils to which it calls attention, and what its educational significance is. Fear as a source of human motives is not discussed, because it "is a product of undue desire or longing."

The subject is presented in a semi-scientific way, and does not probe into the problems very deeply. It contains, however, much of interest.

SLEEP AND SLEEPLESSNESS. H. ADDINGTON BRUCE. *Mind and*
(672) *Health Series.* Pp. ix + 219. Wm. Heinemann, London. 1915. Pr. 5s. net.

THE problems of sleep and sleeplessness are here discussed in a semi-popular psychological manner. Sleep is not an abnormal

condition, it is a normal, protective function having for its purpose the prevention of excessive fatigue. It does not, however, always work smoothly. The writer considers that "on the whole eight hours is, on the average, the amount which adults may most wisely devote to sleep." The average dream is the result of an initial physical stimulus, either internal or external; the dream is an effort to interpret this stimulus, but the manner of the interpretation—*i.e.*, the story the dream tells—is ultimately determined, not by the stimulus itself, but by the character of the emotional complexes that have been roused to greatest activity by incidents of the waking life of the previous day. Many interesting dreams are recorded and explained. Nightmare, a morbid condition of dreaming, and somnambulism, the putting of a dream into action, are both discussed, and illustrative examples given.

Chronic sleeplessness very frequently is caused by "insomnophobia," or fear of insomnia. If treated by drugs the insomnia habit tends to be replaced by the still more disastrous drug habit, or to be more correct, this latter is superimposed upon the former. "The proper treatment for 90 to 95 per cent. of insomnia is by psychological means alone, or psychological means plus hygienic and dietetic modifications of the daily life." "Depending on a state of mind, it is at bottom a question of inducing the insomniac to substitute a new and healthier mental state." The book is simple and readable.

THE INFLUENCE OF JOY. George van Ness Dearborn. *Mind* (673) *and Health Series.* Pp. xviii + 223. Wm. Heinemann, London. 1916. Pr. 5s. net.

An interesting semi-popular essay upon the subject of "joy" will be found here. That joy and happiness have a stimulating tonic effect on the human organism is known to all from individual experience. But the mechanism by which this reaction is produced is more difficult to understand, and the attempt is here made to explain how this is brought about, and to show how real is the bodily influence of a happy mental state.

The book is divided into two parts. The first deals with the power of joy, and its influence on nutrition, on the circulation, on the nervous system, and on reproduction. The second deals with the necessity of joy. Joy is active and progressive, strenuous, while grief and pain, its opposite, are quiet and obstructive of real living. Physical activity stimulates mental activity and develops latent mental activity. In order that all the numerous functions of the body work in harmony with one another an absence of all disturbing influence is necessary. The well-known work of Pavlov

and others on digestion is referred to, and experiments quoted showing that quite a slight psychic disturbance is enough to inhibit peristalsis and form the starting point of a vicious spiral. The body has the complete machinery for preserving the happiness of the individual, and it is a matter of importance that by proper will-power and training this be utilised to the full. Cases of supposed heart collapse due to joy are considered by the author to be really the result of apoplexy from a sudden great rise in the arterial blood pressure. "Gladness as an effective agent in our behaviour is eminently easy of cultivation." "Gladness of effective permanence and degree is not a mere theory of the optimistic morning sunshine, but a thoroughly practical and practicable human attitude."

BOOKS AND PAMPHLETS RECEIVED.

Binet, Alfred, and Simon, Th. "The Development of Intelligence in Children" (The Binet-Simon Scale.) Translated by Elizabeth S. Kite. *Publications of the Training School at Vineland, New Jersey; Department of Research*, No. 11, May 1916.

Binet, Alfred, and Simon, Th. "The Intelligence of the Feeble-Minded." Translated by Elizabeth S. Kite. *Publications of the Training School at Vineland, New Jersey; Department of Research*, No. 12, June 1916.

Holt, Edwin B. "The Freudian Wish." Pp. vii+212. T. Fisher Unwin, Ltd., London. Pr. 4s. 6d. net.

Patrick, G. T. W. "Psychology of Relaxation." Pp. viii+280. Houghton Mifflin Co., Boston and New York, 1916. Pr. 5s., or $1.25 net.

"Reports from the Pathological Laboratory of the Lunacy Department," New South Wales Government. Vol. iii., 1916. Wm. A. Gullick, Government Printer, Sydney. Pr. 7s. 6d.

Review
of
Neurology and Psychiatry

Original Articles

THE HISTOLOGY OF DISSEMINATED SCLEROSIS.

By JAMES W. DAWSON, M.D.

WITH A

PRELIMINARY COMMUNICATION

By the late ALEXANDER BRUCE, M.D., LL.D., and JAMES W. DAWSON, M.D.

III.

METHODS.

In order to obtain as comprehensive a view as possible of the distribution of the lesions and of their structure, a very large number of sections, both large and small, have been examined from the brain and spinal cord of each case. The brain was fixed in Pick's solution, and, after the tissue had acquired a certain consistency, was cut into pieces suitable for the respective methods. The spinal cord, after small pieces at various levels had been removed for Cajal's silver method for axis cylinders, was also placed in Pick's solution.

The cerebral hemispheres were removed from the pons and cerebellum by a section at the upper margin of the pons at right angles to the transverse fibres of the pons. They were then separated from one another by a vertical sagittal section. Each hemisphere was then cut across horizontally by Pierre Marie's

coup d'élection, a section which passes under and just touches the extremities, anterior and posterior, of the corpus callosum as it appears on the mesial aspect, and is carried horizontally outwards to the lateral aspect of the hemisphere. Successive cuts were made through the whole hemisphere above and below this section, and parallel to it. Each slab of brain tissue averaged one and a half centimetres, and from each hemisphere alternate slabs were mordanted in Müller's fluid for use with the Weigert and Marchi methods for fibre-tract degeneration. Two of these mordanted slabs from each hemisphere at corresponding levels were embedded in celloidin *en bloc*, and from the other portions, which showed sclerotic areas either recent or old, were taken through for the Weigert or Marchi method. From the remaining unmordanted slabs pieces of tissue were removed, either including isolated areas when these lay, *e.g.*, in the central white matter, or, when the sclerotic area involved cortex or subcortical white matter, the tissue section included the adjoining convolution on one or both sides. Such pieces of tissue were embedded in paraffin, or celloidin, or the combined celloidin-paraffin method, or finally were cut as frozen sections. Adjoining sections were then stained by as many of the available methods as possible, so that by the aid of differently stained sections, adjoining one another, a reconstruction of the complete histological picture was made possible.

The cerebellum, pons, and medulla oblongata were cut through by means of sections parallel to the original cut, *i.e.*, at right angles to the transverse fibres of the pons, and the pieces of tissue were treated in a manner similar to that used for the hemispheres, with the exception that in one or two cases the whole of these portions was mordanted.

The spinal cord was cut transversely at levels, corresponding, as far as possible, to the different segments. From each segment, except in the instances to be mentioned later, a portion was embedded in celloidin for the Weigert myelin sheath stain, a portion from each alternate segment for the Marchi method, and a portion from numerous levels for paraffin embedding or frozen sections. A segment from each region of the cord—cervical, dorsal, and lumbar—was in nearly every case cut longitudinally, either in celloidin or paraffin sections, and in several instances, when a sclerosed area was distinctly outlined on the cord surface through the pia, such portions of the tissue were removed,

embedded in celloidin or paraffin, and cut serially either in transverse or longitudinal sections. Longitudinal sections were found of special value in demonstrating changes in the myelin sheath and axis cylinder. In numerous other instances sclerosed areas were traced throughout their whole extent by means of serial sections, and in one case the pons and medulla were cut serially and three sections in every ten stained respectively for myelin sheath, axis cylinder, and cells. The smaller celloidin blocks were cut at 16μ in thickness; the larger, of the whole hemisphere, varied in thickness from 24 to 36μ; the paraffin sections were cut at 6μ.

Three groups of staining methods were used:—

(1) Methods for fibre-tract degeneration. The Weigert myelin sheath stain and the Marchi method are of special value in giving a topographical distribution of the areas, but they permit of very limited histological observations.

(2) The elective staining methods. These render possible the isolated representation of certain tissue constituents, but for this reason they do not give a complete histological picture. The methods for representing fibre-tract degeneration must also be regarded as elective staining methods.

(3) The diffuse stains. These, on the other hand, *e.g.*, Van Gieson's stain and hæmatoxylin and eosin, do not sharply distinguish between the individual elements of the central nervous system, yet are of great value in giving an insight into the detailed structural changes, especially when controlled by elective staining methods.

The Kulschitsky-Pal modification was found to be the best of the many modifications of Weigert's classical method of demonstrating the medullated sheath. This has been used by numerous recent workers as being that which allows sufficient differentiation of the medullary layers without decolorising the finest fibres of the cortex. Weigert used as a test of a satisfactory differentiation the supraradial network which lies between the tangential fibres and the pyramids of Ferrein: any staining which did not show this clearly he regarded as unsuitable. In the preparations through the whole hemisphere it was found impossible to differentiate the medullary layer sufficiently without decolorising this supraradial network, and an endeavour was made to have two sets of preparations in different stages of differentiation.

As a substitute for the Weigert method, with unmordanted celloidin sections and frozen sections, Heidenhain's iron-hæmatoxylin stain was used. This stain brings out the finest fibres in the grey matter of the cord, and in the cerebral cortex the fine fibre network is stained. Frozen sections thus stained are extremely brittle, but sufficient may be left of the section for comparative examination.

The Marchi method used was Orr's modification, in which the penetration of the osmic acid is assisted by a small proportion of acetic acid. It was found, however, that instead of bringing the thin pieces of tissue direct from Müller's fluid into the Marchi fluid, it was preferable to begin with a proportion of 3 : 1 of Müller's fluid and Marchi fluid, and, later, increasing the proportion of Marchi fluid to finish with Marchi fluid of full strength. The results in tissues thus treated were invariably constant. The Marchi-stained sections were frequently counter-stained with safranin.

For the staining of the axis cylinders two specific staining methods were employed. Cajal's silver impregnation method (for myelinated axis cylinders) was used when the tissue could be fixed directly in 96 per cent. absolute alcohol: when the tissue, however, had been already placed in formalin or in Müller's fluid, the Bielschowsky method, or, in the latter case, the Bielschowsky-Williamson method, was used. These staining methods depend on the reducing action of formaldehyde, which acts on an ammoniated silver solution and deposits metallic silver. It stains not only axis cylinders deprived of their myelin sheath, but also those "naked" axis cylinders which no longer contain myelo-axostroma (a cement substance enclosing and holding together the neurofibrils which, as its name indicates, histogenetically and chemically resembles the myelin of the medullated sheath). The extreme uncertainty of the Bielschowsky method and its various modifications has been frequently emphasised. It is undoubtedly "a method full of surprises and disappointments even for the experienced technician." In numerous instances the glia fibrils are also stained, and as these run longitudinally in the same direction as the axis cylinders the result is confusing; at other times the medullated sheath is stained—a point very forcibly brought out in comparing frozen sections stained with iron-hæmatoxylin. The method, however, often gives very serviceable,

and even beautiful, results, and is applicable to both celloidin and frozen sections, but one must accept a negative picture with very great reserve. Two non-essential modifications were adopted, both of which seemed to make the result less capricious. The one, recommended by Schlemmer, has for its object the obtaining of an ammoniated silver solution, of uniform strength, which will not become cloudy or discoloured when exposed to light; the other is an addition of a slight trace of acetic acid to the alcohol in which the sections are immersed before being brought into the ammoniated silver solution.

A third specific staining method for axis cylinders was also tried: Strähuber's aniline blue method, differentiating the sections with saturated sodium hypochlorite solution. The aniline blue, however, while bringing out axis cylinders very beautifully in normal tissues, distinguishes them very insufficiently from the glia fibrils in sclerosed tissue. Strähuber's method stains only those axis cylinders which still retain the myelo-axostroma, or as Strähuber named it, the chromatenin or axo-chromatenin—terms which seemed to him to indicate that the material to which it refers is only one of the constituents of the peri-fibrillar substance. Fibres which have lost their myelin sheath are, therefore, merely non-myelinated axis cylinders, not necessarily naked axis cylinders.

Before leaving axis-cylinder methods, it must be mentioned that there is no specific method analogous to that of Marchi to represent the degeneration of the axis cylinder. Eosin and picro-fuchsin and several other stains frequently bring out the axis cylinders very clearly, but they are not elective stains, and Bartels states that the homogeneous granular masses, which are recognisable in sclerosed areas by means of the diffuse stains, are not seen with silver impregnation.

Elective glia staining methods still leave much to be desired. Virchow noted the extreme susceptibility of the glia fibrils to post-mortem changes, and the necessity of bringing material into the fixing fluid fresh. The Weigert glia method, to which we owe our present knowledge of the finer structure of the neuroglia, both in normal and pathological conditions, is very difficult to work, very capricious, and, in particular, frequently fails in staining the cerebral cortex. Its success, too, is conditioned by the absolutely fresh state of the tissue, and it is also unsuitable

for tissue obtained from experimental animals. The method was not available in this work, as the autopsies were made from twenty-four to forty-eight hours after death. By Mallory's neuroglia method the glia fibrils are said to be brought out very prominently, but in our hands it stained the tissue with such an intensity that it was difficult to distinguish between glia fibrils, axis cylinders, and connective-tissue fibres. Dense glia proliferation is certainly extremely perceptible by this staining method under a low magnification.

Recent glia methods have had in view a simplification of the technique and more constant results than those yielded by either Weigert's or Mallory's methods. Perhaps the simplest of these are those devised by Lhermitte and Guccione (1910) for the study of neuroglia cells and fibrils respectively. These writers claim for their methods that they are available for either normal or pathological material fixed within a reasonable time after death, that they are absolutely constant and specific, and that the exact conditions for success in staining are easily secured. Further, on account of the very exact differentiation of the tissue elements, the staining allows of the share taken both by the neuroglia and connective tissue in inflammation and in other processes being exactly defined, and also brings into evidence the relation of the neuroglia nucleus, protoplasm and fibrils to one another, thus solving the much disputed question of the mode of formation of the fibrils. One great advantage of both methods is that the preliminary fixative is formalin. Frozen sections are taken from distilled water into an osmio-chromo-acetic mixture; from this transferred to Gram's solution, and then to the stain—1 per cent. Victoria blue solution for the staining of the fibrils, and phosphotungstic acid hæmatoxylin for the staining of the cell protoplasm. In normal longitudinal sections of the cord thus stained it was possible to follow the neuroglia fibrils of the white matter as interlacing fibrils—the axis cylinders being almost unstained. In areas of sclerosis also the neuroglia fibril proliferation was clearly brought out, with frequently more or less altered, but unstained, axis cylinders in the meshes. But in the preparations the fibrils, at first stained an intense and beautiful blue, became decolorised very rapidly. Though only moderately successful, therefore, with these stains, I am satisfied of their great value. They are used with frozen sections: the technique, though

elaborate, is much simpler than that of the other methods, and the tissue need not be absolutely fresh.

Neuroglia, if well preserved, stains with all simple methods, *e.g.*, Van Gieson's stain, and of these non-specific staining methods the most valuable were found to be the Heidenhain iron-hæmatoxylin and Ford-Robertson's methyl-violet stains. This iron-hæmatoxylin method is extremely simple, and often gives very beautiful pictures of the glia fibrils, nucleus, protoplasm cell bodies and processes, and their mutual relations. By means of it the structure of the neuroglia cells and the mode of their proliferation and hyperplasia are well brought out, and all phases in the development of the glia fibrils can be followed. The methyl-violet stain is of special value in representing the structure of the patches in the cerebral cortex, and gives a less confusing picture than the iron-hæmatoxylin stain.

For the representation of the ganglion cells, Unna's polychrome methylene blue was used as the modification of Nissl's method. At first introduced by Nissl as an elective stain to reveal a certain portion of the ganglion cells (the chromatophile granules), this method was found to stain not only these granules, but certain component parts of the cell nuclei, not only ganglion cells and glia cells, but connective-tissue cells, and all cell elements in the vessel walls. It stains specially beautifully young actively proliferating elements, *e.g.*, the nuclei, protoplasm, and protoplasmic processes of glia cells in proliferation. Nissl's method was the first which made possible the study of the finer internal structure of the cellular constituents of the central nervous system, but it threw no light upon the elementary fibrils in ganglion cell bodies, nor upon the relation of the glia fibrils to the glia cell bodies. For the latter the glia methods above mentioned have been adopted, but for the former none of the neuro-fibril methods have been used in this study.

Van Gieson's method was used as the routine diffuse stain. Such sections revealed the changes in the blood-vessel walls and the relation of the structural elements of the tissue to one another. In densely sclerosed areas, however, the distinction between axis cylinders and glia fibrils was not sufficiently brought out. The Kulschitsky-Pal sections were also counter-stained with picro-fuchsin to bring out the relation of the vessels to the sclerosed areas.

Heidenhain's iron-hæmatoxylin is a diffuse stain which, as already mentioned, stains the medullated sheath of the nerve fibre, the axis cylinders, and the glia fibrils, but in addition it stains the cell elements of the tissue. This renders the interpretation of the picture a little difficult, but allows of the recognition of the relationship which exists between the different structural elements. This is of great importance in the study of cortical areas of sclerosis, as it brings out the changes in the nerve cells, the glia cells, and the medullated fibres. The medullated sheath of the nerve fibre and the axis cylinder are stained in different shades of greyish blue, the nuclei of the cellular constituents of the tissue have their chromatin structure well brought out, the protoplasm of the nerve cells is a pale yellow, and the chromatophile granules a deep blue. As the medullated fibres are decolorised before the complete structure of the nuclear elements is brought out, it is necessary to have preparations in differing degrees of differentiation.

Numerous other stains were used to bring out individual points, *e.g.*, Weigert's elastic tissue stain, Mallory's connective tissue stain, Gram's stain, Ford-Robertson's palladium methyl-violet stain, and Scharlach R., &c. Many sections stained by Levaditi's silver method for the *Spirochæta pallida* were also examined, but with negative results.

In the foregoing sketch an attempt has been made to indicate the methods which have been relied upon in the histological analysis of the changes in the several tissue constituents. For the myelin sheath Marchi and Weigert's methods have been employed, supplemented by the iron-hæmatoxylin method; for the axis cylinders Cajal's and Bielschowsky's methods; for the neuroglia Heidenhain's iron-hæmatoxylin supplemented by Van Gieson's stain; and for the cellular constituents Unna's polychrome methylene blue and the diffuse stains. For use with frozen sections iron-hæmatoxylin for the myelin sheath, Bielschowsky's method for axis cylinders, Lhermitte and Guccione's stains, and Ford-Robertson's methyl-violet for the glia cells and fibrils, Van Gieson and hæmatoxylin and eosin for the cell elements, and Scharlach R. for fat granular cells.

(*Part IV. will appear in February Number*, 1917.)

Abstracts.

ANATOMY.

THE CONVOLUTIONAL PATTERN OF THE BRAINS OF
(674) **IDENTICAL TWINS: A STUDY ON HEREDITARY RESEMBLANCE IN THE FURROWS OF THE CEREBRAL HEMISPHERES.** F. SANO, *Phil. Trans. Roy. Soc.*, 1916, ccviii., Series B, pp. 37-61 (5 figs.).

THE twins were male and still-born at full term. "A" looked a little smaller than "B." The brain of A weighed 420 gm., and that of B 460 gm. In A the origin of the phrenic nerve was symmetrical in the third, fourth, and fifth nerve roots; in B symmetrical in the fourth and fifth, no origin in the third was found. In A the first dorsal nerve joined the eighth nerve just where the posterior branch separates to contribute for the constitution of the radial nerve; in B the first dorsal joins the eighth nerve immediately outside the spine just above the first rib and remains enclosed with it in the same sheath for 1 cm. before the posterior branch separates. Thus the brachial plexus of B shows on its apical and caudal ends an indication of greater condensation, which is a higher evolutional type of nervous arrangement, but not a fundamental difference in this arrangement.

The larger size of B existed in every lobe of the brain. It was clearly apparent in the frontal, the parietal and the occipital lobes, less in the central convolutions. This gave the different lobes of B a fuller and rounder aspect. A result of the larger size of the convolutions is a greater multiplicity of secondary and transversal sulci in the larger brain. The larger size of B exists with a greater concealment of deep sulci in the parietal and occipital lobes, especially in the interparietal sulcus and in the fossa parieto-occipitalis. The fossa lateralis was the same in both brains. There was no indication of any true inversion of similarity; in other words, when a condition of the left A is similar to that of the right B, the right A will never be similar to the left B.

The general impression which the comparison gives is that all the differences are of secondary importance. There is a very remarkable similarity in the disposition of the furrows. The bigger brain

is the more highly developed; the left hemisphere of this brain is the most advanced, and the most dissimilar from the three others.

This study of the morphological similarities in the convolutional pattern supports the investigations of Galton regarding the functional similarities in every kind of mental temper and activity.

A. NINIAN BRUCE.

PHYSIOLOGY.

DIRECT NEUROTIZATION OF PARALYSED MUSCLES: FURTHER
(675) **STUDY OF THE QUESTION OF DIRECT NERVE IM PLANTATION.** ARTHUR STEINDLER, *Amer. Journ. Orthoped. Surg.*, 1916, xiv., Dec., p. 707.

THE conclusions of the author are as follows:—

Direct neurotization, in the sense of Heineke and Erlacher, is possible. The natural limits of physiological regeneration allow a motor nerve, directly implanted into paralysed muscle tissue, to establish by regeneration the entire chain of neuro-muscular connections. From the experiments it appears that this regeneration becomes complete in from eight to ten weeks after the implantation.

In close succession to the regeneration of nerve tissue, the muscle tissue also regenerates, and this becomes manifest in the reappearance of the normal contours of the fibres and the normal striations.

Physiological test of the reneurotized muscles also shows that regeneration of the muscle takes place centrifugally from the point of implantation.

In none of the experiments could an inclination be observed for a normal muscle to take on additional nerve supply, though ample occasion was furnished to this effect, *i.e.*, hyperneurotization is not possible.

Apparently totally paralysed muscles in infantile paralysis were regularly found to contain a variable number of perfectly normal muscle fibres, and a considerable amount of nervous elements.

A. NINIAN BRUCE.

THE COMPOSITION AND PHYSIOLOGICAL ACTIVITY OF THE
(676) **PINEAL GLAND.** FREDERIC FENGER, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Dec. 16, p. 1836.

FENGER gives an account of the composition of a very large number of pineal glands of cattle, sheep, and lambs; in all, over 7,000 glands were examined.

Conclusions.—"Beef glands are relatively small, and both sheep and lambs contain much more pineal tissue per unit of body weight than do cattle. Infant glands contain less phosphorus and more total nitrogen than adult glands. Pineal glands from both species show only slight contracting power on unstriped muscle. This is very much less than that produced by equal amounts of the posterior lobe of the pituitary body, and not sufficient to be of physiological significance. Since the actions of pineal glands, both on the blood pressure, the pulse rate, and the excised heart, as well as on the uterine and intestinal muscle, are insignificant in therapeutic doses, and since health is not influenced by extirpation of the gland, it becomes difficult, at least with our present knowledge of physiological chemistry, to accept or even consider the pineal body as an internal secretory organ of medicinal value." (It is right to state that with regard to pinealectomy, Fenger relies exclusively on the recent nihilistic teaching of Dandy.)

LEONARD J. KIDD.

(677) **THE INFLUENCE OF CERTAIN FACTORS, ESPECIALLY EMOTIONAL DISTURBANCES, ON THE EPINEPHRIN CONTENT OF THE ADRENALS.** G. N. STEWART and J. M. ROGOFF, *Journ. Exp. Med.*, 1916, xxiv., Dec., p. 709.

No evidence has been obtained that in cats and dogs with the nerves of one adrenal cut, emotional disturbances cause depletion of the epinephrin store of the normally innervated adrenal as compared with its fellow. The depletion of the epinephrin store in cats under morphine is not dependent upon so-called morphine fright, since a similar depletion is found in dogs in which morphine produces symptoms the reverse of fright. The signs of morphine fright can all be elicited by giving morphine to a cat in which one adrenal has been removed and the nerve supply of the other cut, and in which no detectable liberation of epinephrin takes place.

The reactions of the denervated iris elicited by emotional disturbance, asphyxia or etherisation in a cat, one of whose adrenals has been removed and the nerves of the other cut, do not differ from those reactions in cats whose adrenals have not been interfered with.

One adrenal was removed in rabbits, and the epinephrin content of the remaining gland assayed at various periods of time after removal of the first. In general, the second adrenal contained more epinephrin than the first, sometimes double the amount. Marked depletion of the epinephrin store of innervated adrenals as compared with the corresponding denervated glands was seen in animals dead of infections of various kinds.

Diminution of the stock of epinephrin in the adrenal through electrical stimulation of the splanchnics is not easy to demonstrate, despite the fact that the liberation of epinephrin into the blood is notably increased by the stimulation. With short periods of stimulation, however, repeated over a long time at intervals just long enough to prevent fatigue, it has proved possible to demonstrate a distinct depletion. A. NINIAN BRUCE.

PHOSPHATIDES IN THE DUCTLESS GLANDS. FREDERIC FENGER, (678) *Journ. of Biol. Chemistry*, 1916, xxvii., Nov., p. 303.

THE various ductless glands were examined from several hundred cattle of varying ages. Summary:—The pituitary body and the adrenals, as well as the pineal, the infant thymus, and the corpus luteum of pregnancy, contain considerable amounts of phosphatides in excess of ordinary muscle tissue, indicating that the phosphatides play some part in the internal chemistry of these ductless glands. The thyroid does not contain any more phosphatides than straight lean meat (chucks), and it may therefore be assumed that this gland performs its secretory functions independently of the phosphatides. LEONARD J. KIDD.

THEORIES OF HIBERNATION. ANDREW RASMUSSEN, *The American* (679) *Naturalist*, 1916, l., Oct., p. 609.

AN excellent up-to-date review of this difficult question. Rasmussen shows that great diversity of opinion exists as to the immediate cause of hibernation, and of the sudden transformation from the homoiothermal to the poikilothermal state, and vice versa, so characteristic of hibernating mammals. All the theories proposed are based on insufficient data. It is extremely difficult to say which of the various conditions associated or occurring simultaneously with winter-sleep are concerned with the production of the lethargy, and which are the results of this or of some other condition. We are far from having any adequate explanation of the mechanism of this phenomenon, to say nothing of how it was established as a more or less variable character in certain animals. The writer quotes the opinion of many experimentalists, that cold does not cause winter-sleep. And while want of food may be an important factor, yet marmots often hibernate even when plenty of food is available. (This paper contains a vast amount of information, has an excellent bibliography, and is well worthy of study.) LEONARD J. KIDD.

PSYCHOLOGY.

(680) **SHAME.** JAMES RAE, *Journ. Ment. Sci.*, 1916, Oct., p. 756.

THE physical signs and accompaniments of shame are described. It is a physiological state. The vasomotor centre is actuated by the emotion, and the fibres must therefore have a connection with the frontal lobe. The vasomotor centre lies in the floor of the fourth ventricle, and the fibres are believed to pass down the lateral tracts. The vasomotor fibres to the face are mixed up with the fibres of the seventh and ninth cranial nerves. The course of the depressor fibres concerned with flushing is unknown. There is evidently a disturbance of the higher control, and it is interesting to recall the homologous phenomenon of the total absence of shame in dreams. However abruptly a person wakes out of a dream of crime or indecency, no shame is felt, even if the course of the dream be deliberately retraced.

Shame may arise from personal modesty, from fear, from appearing at a disadvantage, from hearing of or seeing some untoward behaviour in others. Numerous interesting examples are given. It is experienced quite irrelevantly to the presence of other people; but it is invariably set up by an incongruity between the shamed person and his associates, and therefore, in the author's opinion, it does not seem too far-fetched to define shame as "the social expression of self-interest."

H DE M. ALEXANDER.

PATHOLOGY.

HYPERPLASIA OF THE PINEAL BODY. HOWARD H. BELL, *Journ.*
(681) *Nerv. and Ment. Dis.*, 1916, xliv., Dec., p. 481.

BELL describes two cases of pineal hyperplasia, with necropsy. Case 1 was a man of 33, who had chronic pulmonary tuberculosis, a hypertrophied and dilated heart, and other lesions; no history of case 2 was available. The changes in the pineals are described and figured. Bell finds, from an examination of forty-five human subjects, that the pineal varies greatly in size. In his case 1 it was more than three times the size in cubic millimetres of the average normal pineal; in case 2 more than six times the normal size. He gives his conclusions thus:—In none of the organs of internal secretion are there cells with characters similar to those of cells of the pineal body.

The pineal cells in young individuals are similar in number and structure to those in pineal bodies of older individuals after involution is established. Pineal cells are intimately related to fibres which resemble those of neuroglia, and there are transitional forms between neuroglia cells and pineal cells. Pineal cells appear to be modified neuroglial cells. In association with the process of involution there may be tumour-like enlargement of the pineal body characterised by proliferation of the pineal cells. In association with hyperplasia of these cells there is no functional disturbance in other organs of the body. LEONARD J. KIDD.

PERITHELIOMA OF HYPOPHYSIS. HARRY JACKSON, *Trans. Chicago*
(682) *Path. Soc.*, 1916, x., Oct., p. 110 (1 fig.).

THIS is the rarest type of tumour of the hypophysis, only one other case having been recorded by Kon in 1908. Five cases of perithelial angiosarcoma are on record.

This tumour was found in a girl aged 12 years, and produced symptoms of gradually increasing blindness. It was about the size of a goose egg, and had slightly eroded and enlarged the sella turcica, but most of it had grown up out of the sella and had pressed the brain upwards, forwards, backwards and laterally. It extended from the frontal lobes to the pons, was covered by a thick capsule and measured 7 by 5·5 by 4 cm.

The diagnosis of perithelioma was based on the presence of a well-defined perivascular space about the abundant blood vessels and the characteristic endothelial cells of the tumour mass.

A. NINIAN BRUCE.

HISTOLOGIC CHANGES IN THE FIRST SYMPATHETIC
(683) **GANGLION IN EXOPHTHALMIC GOITRE.** LOUIS B. WILSON and L. DURANTE, *Journ. Med. Research*, 1916, xxxiv., p. 273.

THE PATHOLOGIC CHANGES IN THE SYMPATHETIC SYSTEM
(684) **IN GOITRE.** LOUIS B. WILSON, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 799.

IN the first paper twenty superior cervical sympathetic ganglia were removed at operation from sixteen patients with exophthalmic goitre, and examined microscopically. The cells in all these ganglia showed changes consisting of various stages of degeneration, namely, (*a*) hyperchromatisation, (*b*) hyperpigmentation, (*c*) chromatolysis, (*d*) atrophy or granular degeneration. Cells resembling the partially differentiated cells found in the ganglia of infants were also found in some of the ganglia.

Similar degenerative changes were found in the nerve fibres, together with an increase in the connective tissue. The pathologic changes were thought to be parallel to the stage and intensity of the symptoms of hyperthyroidism.

In the second paper sympathetic ganglia from twelve other patients were examined and compared with those removed at autopsy from nine patients dying from other diseases, and six Gasserian ganglia removed at operation for trifacial neuralgia. The above results were confirmed, and it was thought that they indicated that a process causing active stimulation, overfunction, and progressive stages of degeneration in these ganglionic cells had been present. Neither advanced age, chronic wasting disease, nor chronic inflammatory processes necessarily cause degenerative changes in the sympathetic ganglia resembling those in exophthalmic goitre. A. NINIAN BRUCE.

A NOTE CONCERNING STRAINS OF *TREPONEMA PALLIDUM* (658) OBTAINED FROM THE BRAINS OF PARETICS AT AUTOPSY. J. A. F. PFEIFFER, *Proc. Soc. Exp. Biol. and Med.* 1916, xiv., 1 (1179).

RABBITS were inoculated with material from the brains after death of seven cases of parenchymatous syphilis (paresis) in order to determine whether there is any possible foundation for the assumption that a neurotropic strain of the *Treponema pallidum* exists.

According to Noguchi a difference in the morphology of several strains of the *Treponema pallidum* exists. Some are thinner than others, and this variation seems to have some distinct relationship to the degree of motility, infectiousness, and facility of cultivation. The thicker forms tend to produce in the testicle of the rabbit hard, indurated, and sharply defined nodules in five to six weeks; while the thinner forms have a shorter incubation period as the testicle becomes swollen in ten to fourteen days, and a large diffuse lesion results.

Of the seven cases here examined, two strains survived several generations. Neither showed any distinctive features in regard to the incubation time. Both hard nodules and large diffuse processes were obtained.

The author thinks the thinner types of Noguchi play just as important a rôle in parenchymatous syphilis of the nervous system as the thicker ones, and that there is no reason to assume that a so-called neurotropic strain exists since the different forms of *Treponema pallidum* may all be isolated in syphilis of the nervous system. A. NINIAN BRUCE.

A STUDY OF EXPERIMENTAL NON-HÆMOLYTIC STREPTO-
(686) **COCCUS LESIONS IN VITALLY STAINED RABBITS.** RUSSELL, L. CECIL, *Journ. Exp. Med.*, 1916, xxiv., Dec., p. 739 (3 plates).

REPEATED injection into rabbits of non-hæmolytic streptococci isolated from human cases of infectious endocarditis or rheumatic fever will produce an acute arthritis in the rabbit similar in most respects to the arthritis of acute rheumatism.

Microscopical sections of the joints show a gradual transition from an acute exudative inflammation to advanced organisation.

Endocarditis and pericarditis occur in a small percentage of cases, and focal lesions in the myocardium consisting of necrosis, and the infiltration of cells are frequent. These focal lesions differ considerably from Aschoff's submiliary nodules. Lesions in the kidneys and liver occur, but are not characteristic.

The large endothelial cells seen in the joint and myocardial lesions probably develop from the vascular endothelium.

A. NINIAN BRUCE.

CLINICAL NEUROLOGY.

THE SUPERIOR RADIO-PRONATOR REFLEX. (Réflexe radio-
(687) **pronateur supérieur.)** LANDAU, *Soc. de Neurol. de Paris*, 7th Dec. 1916. (*Presse Médicale*, 1916, Dec. 18, No. 70, p 589.)

LANDAU describes a new periosteal reflex. Percussion on the head of the radius, immediately below the humero-radial interspace, gives a brisk pronation of the forearm. An anatomo-clinical study of this superior radio-pronator reflex is promised.

LEONARD J. KIDD.

ON THE FACIAL PHENOMENON AND THE CONTRALATERAL
(688) **FACIAL SIGN. (Sur le phénomène de la face et le signe contralateral de la face.)** DÉMÈTRE-EM. PAULIAN, *Rev. Neurol.* 1916, Feb., p. 209

PIERRE MARIE and FOIX having described a homolateral contraction of the facial nerve when its trunk was compressed, this author has confirmed and extended their observations. Marie and Foix found this contraction present on the sound side, but lacking on the affected side in cases of facial paralysis, recent or old hemiplegias, and during the course of hemiplegic coma. Paulian confirmed this in his cases, and also found that compression of the facial trunk on the affected side produced a contralateral contraction on the sound side; on the other hand, compression of the healthy

facial was without contralateral effect. The compression of the facial on the affected side is painless, whilst compression of the sound facial may produce pain lasting a whole day. The compression needs to be energetic. These phenomena are held to establish the organic nature of a facial lesion, and to serve the purpose of diagnosis in a lesion which has improved.

H. W. HILLS.

CONTRIBUTION TO THE STUDY OF NERVOUS DISTURBANCES
(689) **OF REFLEX ORIGIN. (Contribution à l'étude des troubles nerveux d'ordre réflexe.)** J. BABINSKI and J. FROMENT, *Rev. Neurol.*, 1915, xxii., Nov. and Dec., p. 925.

THIS is an analysis of six cases with lesions of the hip region which only very slightly affected the joint itself. The tendon reflexes were examined with a view to determining the functional or organic nature of the disability in walking. The examinations were made in the normal state, and under and also after chloroform anæsthesia. It is claimed that anæsthesia definitely rules out the possible influence of the will, and accentuates the asymmetry of the two limbs by increasing the tendon reflexes of the injured member. In some cases an intense and prolonged clonus of the patellar reflex is present in the limb affected after all other skin and tendon reflexes have disappeared. When this latter phenomenon was uncertain, examinations during return to the normal state showed a reappearance of the reflex first on the affected side, or its exaggeration when both came back simultaneously. This behaviour under anæsthesia is considered definite proof of the organic origin of the disorder observed in walking.

H. W. HILLS.

THE OCULO-CARDIAC REFLEX IN TRAUMATIC LESIONS OF
(690) **THE VAGI NERVES. (Le réflexe oculo-cardiaque dans les lésions traumatiques des pneumogastriques.)** COLLET and PETZETAKIS, *Compt. Rend. Soc. de Biol.*, 1916, lxxix., Dec. 16, p. 1147.

THE oculo-cardiac reflexes were tested carefully in five cases of war injuries of one vagus nerve: all were seen about a month after the injury, and most were observed for a period of some months. There was laryngeal palsy in all, but from the situation of the wound it was probable that the vagus trunk in the neck, and not the recurrent laryngeal nerve, was injured. All showed permanent acceleration of pulse, up to 132; variability of pulse rhythm; arhythmia of sinus origin with occasional extrasystoles. The disturbances of cardiac rhythm did not lessen. In all five cases

the oculo-cardiac reflex on the unaffected side was normal (slowing of heart), whilst on the affected side it was inverted (accelerated). The writers conclude that both vagus and sympathetic form the centrifugal path of the oculo-cardiac reflex, and that lesions of the cervical vagus may cause laryngeal palsies.

LEONARD J. KIDD.

THE TREATMENT OF FRACTURE OF THE SPINE. NORMAN (691) SHARPE, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 865.

A DISCUSSION of the operative treatment of fracture of the spine. Ten illustrative cases are described, and the following reasons for and advantages of early laminectomy put forward:—

1. It relieves pressure from the cord, whether due to depressed bone or blood clots.
2. If fracture dislocation, it allows the cord ample room, relieving pressure effects of angulation.
3. It provides drainage of the certain œdema, which by its compressive effects is destructive to the nerve fibres.
4. It allows for drainage of hæmorrhage, if present, the compressive effects of which may be so great as to permanently damage the cord.
5. It gives the damaged cord the best possible chance for repair, and is not a difficult or dangerous operation in skilled hands.

A. NINIAN BRUCE.

CIRCUMSCRIBED CYSTS OF THE LEPTOMENINGES, WITH THE REPORT OF A SUCCESSFUL OPERATIVE CASE. (692) FREDERIC M. HANES and A. M. WILLIS, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 859.

A MAN, aged 26 years, developed a progressive paralysis of both legs of about one year's duration. The legs became constantly flexed, and on the slightest stimulation passed into a state of tonic spasm. At no time in the illness had the patient suffered from any pain, and sensation to touch, pain, heat and cold was deficient over the legs and trunk up to the ninth dorsal segment. There was double ankle clonus, and a double Babinski's sign. The spinal fluid had a distinct yellowish tinge, only three lymphocytes to the cubic mm., and a very marked excess of protein. The Wassermann reaction was negative in both blood and spinal fluid.

An extramedullary tumour compressing the cord was diagnosed, and after laminectomy, a thin-walled cyst about the size of a cherry was found at the level of the sixth dorsal vertebræ. Only one cyst was found. It was incised. Ten days later the patient

was able to stand for a moment or two alone, and gradual improvement followed.

The authors consider that before long *exploratory laminectomy* will be resorted to with greater frequency than at present.

A. NINIAN BRUCE.

REPORT OF A CASE OF SPINAL CORD TUMOUR. W. W. (693) PLUMMER, *Amer. Journ. Orthoped. Surg.*, 1916, xiv., Dec., p. 734 (3 figs.).

A BRAZILIAN boy, aged 16, complained of persistent high dorsal backache, followed by pains in both legs, tendency to convulsive movements in his legs, and a gradually increasing spastic paralysis of both lower limbs. There was a marked deformity of the upper spine, commencing trophic changes in the skin, a positive Babinski's sign and exaggerated reflexes. Sensation was lost up to the region of the third rib. Control of the sphincters was not lost. A skiagram did not help in any way, and the Wassermann reaction was negative.

Laminectomy was decided upon, but on making an incision over the spinous process of the second dorsal vertebra, the knife suddenly entered a cavity from which dark fluid gushed out. It was then found that the spinous processes and laminæ of the second and third dorsal vertebræ were uniformly eroded to tissue paper thinness. When the cavity was exposed a dark, cyanotic and friable tumour mass was seen. The spinal cord could not be traced through the tumour or below. Histological examination of the tumour showed a giant cell sarcoma. A second attempt to remove the tumour was unsuccessful as it had extended out into the root foramina, and the cord could not be traced after it had entered the tumour mass.

A. NINIAN BRUCE.

A FATAL CASE OF POLIOMYELITIS IN AN ADULT. J. G. SMITH, (694) *Med. Record*, 1916, xc., p. 373.

THE patient was a man, aged 20, who presented a mixture of the encephalitic and bulbo-spinal types. Death occurred on the fifth day, probably from paralysis of the respiratory and vaso-motor centres.

J. D. ROLLESTON.

INFANTILE PARALYSIS TREATED WITH IMMUNE SERUM. (695) O. H. PETTY, *New York Med. Journ.*, 1916, civ., Dec. 16, p. 1190.

ELEVEN cases are briefly described, in all of which the serum was administered subdurally, and in which no unfavourable symptoms were noted. Immune human serum should be given early, preferably by the subdural route in the preparalytic stage.

A. NINIAN BRUCE

TABETIC OCULAR CRISES. WILLIAM G. SPILLER, *Journ. Amer.* (696) *Med. Assoc.*, 1916, lxvi., March 18, p. 855.

REPORT OF A CASE OF TABETIC OCULAR CRISIS. J. C. (697) MICHAEL, *Journ. Amer. Med. Assoc.*, 1916, lxvii., Dec. 23, p. 1936.

BUT few cases of tabetic ocular crisis have been recorded since Pel (*Berliner Klin. Wochschr.*, 1898, xxxv., p. 25) first described them. Spiller gives particulars of Pel's case, and also of the cases of Haskovec (*Revue Neurol.*, 1906, xiv., p. 391) and of Knauer (*Münch. Med. Wochschr.*, 1908, Sept. 15, p. 1926). Spiller's case showed some peculiarities not hitherto recorded, viz., phenomena of irritation of visual fibres. A coloured man, with typical tabes, had difficult micturition, optic nerve atrophy, ataxic gait, Rombergism, shooting pains in lower limbs, loss of tendon jerks, &c. The attacks of pain in eyes and neighbourhood dated from 1901, and occurred with tabetic pains elsewhere. During attacks patient says he clearly saw flashes of light, twisting and taking the shape of reptiles, birds, houses, men, and various forms of animals. He describes these ocular crises as occurring at irregular intervals: they may occur many times a day, but the visual phenomena never occur without pain in eyeballs. The pain is intense, jerking, stinging, and burning; and the eyeballs feel as if they would come out of the orbits. The pain may last half an hour or more, it is accompanied by free lachrymation, and may suddenly remit and suddenly begin again with great severity. During these attacks he may see visions of water revolving and then bursting, giving place then to figures of live lobsters, crabs, and fish, of red and brown colours, moving forwards and backwards: he may also see "magnificent" coloured flowers whose beauty would delight him if it were not for the pain. He sees also human faces, but not of those he knows, and also blue stars on a brown background. He has no mental symptoms, is entirely rational, and realises that these visual phenomena have no real existence. He is totally blind, and cannot even recognise daylight. He has been observed for many years by Dr Spiller, at irregular intervals. (The patient was shown by Dr Dercum to the Philadelphia Neurological Society in 1910, to demonstrate that closure of the eyes greatly increased his ataxia, although he was blind.)

In some respects Michael's case closely resembles Spiller's case (*v. supra*), but the ocular crises seem to have occurred later in the disease. For ten years stiffness of knees, uncertain gait, disturbed urination, loss of sexual power, lightning pains in legs, &c ; onset of tabes when patient, a man, was 32. In March 1916 double primary optic atrophy: serological and clinical findings, those most commonly found in tabes. For one month patient had complained of sharp stabbing pains in left eye, coming on at irregular intervals

and lasting several seconds: during these attacks he sees momentary flashes of light before the affected eye, and feels an irritation, as of a hair in that eye: the conjunctiva is reddened during the attack and becomes moistened with tears. Three weeks later, in hospital, he said: "Yesterday morning, on waking, my left eye felt as though it had swollen the size of a base ball." The skin, over an area from the vertical midline of the face laterally as far as the outer border of left eyebrow, and down as far as the moustache, seemed to prickle and feel warm. Pain continued in face all day, and numbness in that side of face continued next day. There were no visual disturbances on this occasion. On 20th April attacks of stiffness and numbness of left face, lasting several minutes to hours: gums felt as if swollen: at these times there were no pains and no photophobia nor lachrymation. On 1st May patient said that yesterday he felt as if the left side of his face was coming out, especially the cheek bone. There was burning sensation in eyeball, lasting about half an hour, with lachrymation, and also several momentary attacks of pain and flashes of light before the eye. This syndrome recurred occasionally thereafter. Patient left hospital, and died at home early in July. (It is noteworthy that the ocular crises seem to have been exclusively strictly unilateral.) LEONARD J. KIDD.

VERY MARKED SPASTIC PARAPLEGIA OF FIFTEEN YEARS
(698) **DURATION: DEATH DUE TO DIABETES MELLITUS AND BOILS.** BYROM BRAMWELL and JAMES W. DAWSON, *Edin. Med. Journ.*, 1916, xvii., Dec., p. 411.

A CASE of a woman who presented symptoms of a most marked spastic paraplegia, apparently primary, and in whom none of the other characteristic symptoms of disseminated sclerosis developed. The symptoms commenced when she was 39 years of age, and were attributed to sleeping in a damp bed. Death occurred with symptoms of acetone poisoning.

Microscopic examination of the spinal cord showed typical areas of disseminated sclerosis, which involved the crossed pyramidal tracts in both lateral columns for several segments.

A. NINIAN BRUCE.

A FATALITY FOLLOWING ACUTE OTITIS MEDIA. I. W.
(699) VOORHEES, *Med. Record*, 1916, xc., p. 548.

A MAN, aged 41, developed acute otitis media after influenza. In spite of treatment, death took place within a month, preceded by symptoms of mastoiditis, brain abscess, and rupture into the lateral ventricle. No autopsy. J. D. ROLLESTON.

CEREBELLAR HEMIPLEGIA. (Sur quelques cas d'hémiplégie céré-
(700) **belleuse.)** DÉMÈTRE-EM. PAULIAN, *Rev. Neurol.*, 1916, xxiii., July p. 18.

A RÉSUMÉ is given of the work of Joseph Thiers, who has described a series of cases showing a cerebellar hemi-syndrome either rapid in onset due to arterial lesions, hæmorrhages or softening, or slow in onset due to tumours of various kinds.

The author describes four cases all occurring in old syphilitics, which from their rapid onset and betterment under treatment, were thought to be due to an arteritis localised to the cerebellar tracts. D. K. HENDERSON.

INFANTILE HEMIPLEGIA AND HEREDITARY SYPHILIS.
(701) **(Hémiplégies de l'enfance et syphilis héréditaire.)** L. BABONNEIX, *Rev. Neurol.*, 1916, xxiii., July, p. 1.

A RATHER general paper showing that the hemiplegias of infancy, especially those of a spasmodic type, are essentially of syphilitic origin. An exception is made of those cases occurring during measles, whooping cough, and scarlet fever. Most frequently the father is the source of infection. D. K. HENDERSON.

STOCK-BRAINEDNESS, THE CAUSATIVE FACTOR IN THE SO-
(702) **CALLED "CROSSED APHASIAS."** KENNEDY FOSTER, *Amer. Journ. Med. Sci.*, 1916, clii., Dec, p. 849.

SIX cases are described, or quoted, three of which were left-handed and three right-handed. Of the three left-handed cases, in two hemiplegic lesions in the right hemisphere were followed by no disturbance of speech, while in the third an embolus on the left side caused right hemiplegia and aphasia. All of the three right-handed cases suffered from lesions on the right side of the brain causing left hemiplegia, and were all accompanied by aphasia.

The author points out that such cases of "crossed aphasia" may be explained by considering whether the patient's stock is a right-handed or a left-handed one. A left-handed person occurring in a right-handed stock is dominated by the trend of that stock rather than by his own individual peculiarities, and vice versa.

The above three left-handed cases all occurred in a right-handed stock, and the three right-handed cases in a left-handed stock. A. NINIAN BRUCE.

LONGITUDINAL RADIAL ECTROMELUS. (Contributo allo studio della ectromelia radiale longitudinale.) E. TROCELLO, *Riv. di patol. nerv. e ment.*, 1916, xxi., p. 522.
(703)

A MAN, aged 49, presented (*a*) complete congenital absence on the right side of the radius, scaphoid, trapezium, and bones of the thumb; atrophy or absence of the muscles on the radial side of the hand, forearm, and upper arm; deformity or dystrophy of the bones of the right upper limb, and morphological changes in the bones of the thorax, vertebral column, and rest of the body; (*b*) a state of mental defect with transient attacks of excitement; (*c*) in the affected limb increase of excitability of the tendon reflexes, slight hyperæsthesia to touch, heat and pain with indefinite limits, and involving the hand. Electrical excitability showed that the muscles, even those involved in the deformity, possessed a contractility but little differing from the homologous muscles on the left side; only in the muscles of the ectromelic forearm was there a tendency to R.D. The median nerve responded normally, with very slight differences, on the two sides. The right radial nerve was not excitable. On stimulation of the ulnar nerve at the olecranon, a contraction of the flexor muscles of the hand and fingers was obtained, without any response in the small muscles of the hand innervated by that nerve.

J. D. ROLLESTON.

RÖENTGENOGRAPHY IN THE LOCALISATION OF BRAIN TUMOUR, BASED ON A SERIES OF ONE HUNDRED CONSECUTIVE CASES. GEORGE J. HEUER and WALTER E. DANDY, *Bullet. Johns Hopkins Hosp.*, 1916, xxvi., Nov., p. 311 (illust.).
(704)

AFTER a brief historical review of the subject, the writers show that, regarded from the standpoint of X-ray diagnosis, brain tumours may be divided into three classes:—

1. Those which cast a shadow.
2. Those which cause some deformation of the skull.
3. Those which give no evidence of their presence radiographically.

1. There is no evidence that an uncalcified tumour casts a shadow unless it has invaded, for instance, the sphenoidal sinus, and is thus brought into contrast with an air-containing space.

True bony tumours or those containing lime cast shadows which can be readily recognised; but this condition is rare—about 6 per cent.

2. General changes in the conformation of the skull are such

as would occur from internal pressure, *i.e.*, general enlargement, separation of sutures, general convolutional atrophy.

Local changes are found, and are of the greatest value in the diagnosis of hypophyseal or supra-sellar lesions.

In about 45 per cent. of the cases in the series, röentgenography has been of real diagnostic value.

A well-printed selection of reproductions from the radiographs of the cases accompanies the text. W. H. HOOTON.

A CASE OF DIABETES INSIPIDUS WITH A PECULIAR
(705) **NECROPSY FINDING IN THE POSTERIOR LOBE OF THE PITUITARY BODY.** F. PARKES WEBER and HANS SCHMIDT, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 892.

A MAN, aged 37 years, developed polyuria and polydipsia suddenly immediately after the removal of an enlarged lymphatic gland from his neck in August 1913. He died in June 1915 with physical signs of pulmonary and laryngeal tuberculosis. The Wassermann reaction was negative in the blood. The urine was free from albumin and sugar, and reached as much as 13,250 c.c. in the twenty-four hours. X-rays showed no enlargement of the pituitary fossa.

At the autopsy the pituitary body, as a whole, was not enlarged. On section the posterior lobe (pars nervosa) almost completely enclosed the anterior lobe, and was of a yellowish-brownish colour. The anterior lobe presented the usual glandular structure, but the posterior lobe contained large clumps of granular cells. The granules consisted of minute droplets of a lipoid substance. The cytoplasm also contained crystals, doubtless of some fatty acid. These cells were thought to be possibly of neuroglial origin, and represented one kind of the "compound granular cells" which are so characteristic of various abnormal conditions of the central nervous system. These changes were in some way thought to be the result of the patient's tuberculosis.

A. NINIAN BRUCE.

THE ETIOLOGY OF PELLAGRA: A CONSIDERATION OF
(706) **VITAMIN DEFICIENCY.** EDWARD J. WOOD, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 813.

PIGEONS fed on corn meal with a P_2O_5 content of 0·58 per cent. were noticed after ten days to have red legs, and to show marked droopiness and inactivity. After six weeks a more deficient meal with a P_2O_5 content of 0·29 per cent. was substituted, but no change was observed except increased redness of the legs. Polyneuritis did not develop. Eggs laid several weeks after the

beginning of the experiment hatched out. The birds developed polyneuritis a few days after they began to feed themselves. By the administration of corn chops prompt relief resulted. The red-legged condition was regarded as due to a partial deficiency, while the polyneuritis was the result of complete deficiency. The former condition may be compared to pellagra, the latter to beri-beri.

Four cases of pellagra are then described. These were fed on corn chops, and all were considered improved.

A. NINIAN BRUCE.

THE REACTION OF HERMANN-PERUTZ IN SYPHILITIC
(707) **AFFECTIONS OF THE NERVOUS SYSTEM. (La reazione di Hermann-Perutz nelle affezioni sifilitiche del sistema nervoso.)**
G. CORSO, *Riv. di patol. nerv. e ment.*, 1916, xxi., p. 513.

CORSO reviews the literature and records his investigations with this method on the serum of 47 patients. Eight were cases of general paralysis, 2 of tabes, and 13 had various syphilitic manifestations in the nervous system, while in 24 syphilis could be absolutely excluded. Of the 23 syphilitic cases only 9 gave a positive result, whereas 3 of the non-syphilitic cases were positive. Corso concludes that the Hermann-Perutz reaction, like all the other precipitin reactions on record, cannot be considered specific, and therefore cannot be used as a diagnostic criterion.

J. D. ROLLESTON.

A COMPARATIVE STUDY OF DIFFERENT METHODS OF PER-
(708) **FORMING THE WASSERMANN TEST FOR SYPHILIS.**
J. WHEELER SMITH, Jun. and W. J. MACNEAL, *Proc. Soc. Exp. Biol. and Med.*, 1916, xiv., 5 (1183).

WASSERMANN tests were performed by three methods upon 496 identical specimens from 477 patients. In the first method a cholesterin-reinforced antigen was employed, and the first incubation was carried out at 37° C. In the second method a simple alcoholic extract was used as antigen, with incubation also at 37° C. In the third method this latter antigen was again employed, but the first incubation was carried out in the refrigerator for a period of four to twenty-four hours.

The last method proved more sensitive in the group of known syphilitics than the other procedures tested. Furthermore, a positive result thus obtained proved to be more trustworthy evidence of syphilis than did positive results obtained with the cholesterinized antigen and first incubation at 37° C.

A. NINIAN BRUCE.

THE COMPLUETIC REACTION (WASSERMANN) IN AMENTIA: AN ORIGINAL STUDY OF 100 CASES. (709) HAROLD FRIEZE STEPHENS, *Journ. Ment. Sci.*, 1916, Oct., p. 657.

THE author advocates the use of the term "Compluetic Reaction" in lieu of the term "Wassermann Reaction" at present in use, as the principle of the test was not discovered by Wassermann.

The technique in current use at Guy's Hospital was used, and is described in detail. The blood serum of 100 male patients (70 imbeciles and 30 idiots) was examined, and 42 gave a positive reaction—of these 12 were "definitely positive," 16 "weakly positive," and 14 "doubtfully positive." The positive reaction was strongest between the ages of 16 and 21. Few cases showed any signs of syphilis on the body.

In these cases of amentia the syphilitic virus did not appear to be wholly responsible for the mental condition, but "seemed rather to have been associated with and to have acted upon inherently defective, diseased and degenerated, or damaged tissues."

An appendix to the paper shows the results of other observers in tabulated form. H. DE M. ALEXANDER.

SALVARSAN IN THE TREATMENT OF DOUBLE INFECTIONS, TUBERCULOSIS AND SYPHILIS. (710) NATHANIEL BOWDITCH POTTER, *Amer. Journ. Med. Sci.*, 1916, clii., Dec., p. 823.

SALVARSAN or neosalvarsan is indicated in latent, chronic and moderately active tuberculosis if an added infection is diagnosed as syphilis, or if the history, signs or symptoms suggest a previous syphilitic infection, and especially if the patient be not improving under the usual treatment for tuberculosis. Active, acute and diffuse miliary tuberculosis are usually definite contraindications, although syphilitic patients in the first two groups may do well with small doses of salvarsan cautiously increased.

When tuberculosis infects or becomes active in a patient with secondary, tertiary or even latent syphilis, the careful employment of salvarsan or neosalvarsan is also indicated.

A. NINIAN BRUCE.

HUNTINGDON'S CHOREA IN RELATION TO HEREDITY AND EUGENICS. (711) CHARLES B. DAVENPORT and ELIZABETH B. MUNCEY, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 195.

SOME idea of the vast extent of work concerned in this article may be got from the fact that 4,370 individuals have been considered, and of these there were 441 female and 521 male choreics. The cases of chronic chorea are grouped into four classes: (*a*) absence of tremors, but presence of mental deterioration; (*b*) absence of

mental deterioration despite progressive tremors; (*c*) absence of the progressive element of the disease; (*d*) relatively early onset of the disease. From the data collected it is shown that the symptomatology of chronic chorea is dissimilar in different strains of families. The age of onset, the degree of muscular involvement, the extent of mental deterioration, all show family differences, and enable us to recognise various species—or *biotypes*—of the disease. These biotypes are less striking than they would be were it not for the extensive hybridisation that is taking place between biotypes in random human matings. Practically all of those 962 cases of chronic chorea have been traced back to some half-dozen individuals, including three (probable) brothers who migrated to America during the seventeenth century. The choreic movements never skip a generation, and in other respects show themselves clearly to be a dominant trait. The mental disorder associated with chronic chorea is essentially of the manic-depressive type, but a dementing type is also common.

Among the 3,000 odd relatives of these 962 choreics, epilepsy is recorded 39 times, infantile convulsions 19 times, meningeal inflammation and brain fever 51 times, hydrocephaly 41 times, feeble-mindedness 72 times, Sydenham's chorea 11 times, and tics 9 times. This all suggests that chorea occurs in families characterised by a general liability to nervous and mental troubles. "It would be a work of far-seeing philanthropy to sterilise all those in whom chronic chorea has already developed, and to secure that such of their offspring as show prematurely its symptoms shall not reproduce." D. K. HENDERSON.

REMOVAL OF THE APPENDIX FOR THE CURE OF TRIFACIAL
(712) **NEURALGIA AND OTHER NERVE PAIN ABOUT THE HEAD AND FACE.** M. I. ROSENTHAL, *Amer. Journ. Obstetrics*, 1916, lxxiv., Dec., p. 1031.

SEVEN cases are described. The benefit following removal of the appendix was attributed to the fact that the disturbance was a toxemia with selective action. Migraine may also benefit by removal of a diseased appendix. A. NINIAN BRUCE.

CEREBRAL LESIONS IN AVITAMINIC POLYNEURITIS. (Les
(713) **lésions cérébrales de la polynévrite avitaminique.**) J. LHERMITTE, *Rev. Neurol.*, 1916, xxiii., July, p. 6.

FUNK holds the view that beri-beri, pellagra, Barlow's disease, and scurvy are all essentially due to the absence of vitamines, and to this group of diseases he has given the name "avitaminoses."

A young fowl fed on polished and decorticized rice in the course of a few weeks developed diarrhœa, progressive emaciation, total paralysis of the wings, and partial paralysis of the legs. The examination of the brain showed lesions similar to those found in cases of classical polyneuritis; there was a modification of the form and colour of the nerve cells, progressive disintegration of the nerve cells, and a proliferative reaction in the neuroglia.

D. K. HENDERSON.

PERIPHERAL NEURITIS FOLLOWING EMETIN TREATMENT OF AMŒBIC DYSENTERY. (714) A. R. KILGORE, *Boston Med. and Surg. Journ.*, 1916, clxxv., p. 380.

A RECORD of seven cases, three in adults and four in children. Kilgore's conclusions are as follows:—

1. Peripheral neuritis after emetin is not uncommon.
2. The commonest symptoms in this neuritis are general muscular pain and weakness, especially in the legs.
3. The neuritic symptoms often develop after the emetin injections have stopped, and may grow progressively worse for some time.
4. The amount of emetin necessary to produce neuritis varies greatly.
5. The prognosis is good. The symptoms clear up in several weeks and leave no trace.
6. Experiments show that peripheral neuritis may be produced in dogs by emetin.

J. D. ROLLESTON.

THROMBO-ANGIITIS OBLITERANS. (Non-syphilitic arteritis obliterans of Hebrews.) (715) F. PARKES WEBER, *Quart. Journ. Med.*, 1916, ix., July, pp. 289-300 (3 figs.).

THIS affection occurs almost exclusively among adult Jewish males. In nearly every case there is a history of habitual cigarette smoking, although it is improbable that this is more than a contributory factor in inducing the disease. The essential cause is unknown. Acquired or hereditary syphilis is almost invariably absent. The blood-pressure is seldom high, and there are seldom signs of general arterio-sclerosis or of chronic interstitial nephritis.

The characteristic symptoms of the disease are: (1) Redness or cyanosis of the foot when it is allowed to rest in a dependent position; (2) pallor of the foot on movement of the ankle-joint; (3) intermittent claudication, with feeling of cramp or pain in the muscles of the calf or instep on walking for a few minutes

(angina cruris); and (4) absence of pulsation in the arteries of the foot, notably the dorsalis pedis artery.

The symptoms usually attack one of the lower limbs, and may involve the other later; occasionally one or both upper extremities or another part of the body may be involved. The affection progresses by periods of exacerbation alternating with long periods of remission. Surgical interference (amputation) may be necessary because of the intolerable pain and insomnia during exacerbations associated with ischæmic ulcerations, or to the occurrence of acute septic complications. The affection may be complicated by attacks of phlebitis and venous thrombosis.

"Intermittent claudication," when it occurs in one or both lower extremities, is generally described as a cramp-like pain in the muscles of the calf or in the small muscles of the foot, induced by walking, but rapidly recovered from on resting, and then recurring at more or less regular intervals, if, after resting, the patient tries to walk again. "Intermittent claudication" is not synonymous with this disease, it is only a symptom of it just as it is of syphilitic arteritis and traumatism of arteries. It plays no part in the symptomatology of very bad cases, who cannot get about at all.

"Erythromelalgia" means a painful condition of an extremity associated with redness (or cyanosis). The term is well adapted to be applied to this type of case, although they are not the kind of case to which the term was originally applied. It would perhaps, however, be best to use the term only symptomatically to express the symptom-complex of pain in an extremity, associated with redness or cyanosis, especially when the limb is allowed to hang down, or is kept in a dependent position, favouring venous and capillary congestion. A. NINIAN BRUCE.

THE CEREBRAL ASSOCIATIONS OF RAYNAUD'S DISEASE.

(716) HUBERT J. NORMAN, *Journ. Ment. Sci.*, 1916, Oct., p. 730; *Lancet* 1916, Dec. 23, p. 1049.

RAYNAUD in enumerating the predisposing causes of the disease bearing his name noted that those chiefly affected were persons of a "nervous or lymphatic" temperament, and in the history of the patient he laid stress upon the influence of the neuroses, especially hysteria and epilepsy.

In this paper the author has collected, from the literature on the subject, cases of hysteria, epilepsy, mania and melancholia, mental enfeeblement, aphasia, ocular troubles, headache, and hemiplegia associated with Raynaud's disease. In manic-depressive insanity the symptoms of Raynaud's disease may

appear either during the maniacal or during the depressed phase, and the writer relates three examples from his practice in a military hospital.

The theories which have been promulgated as to the exact condition in the nervous or vascular systems giving rise to the varied symptoms of Raynaud's disease are discussed. A very complete bibliography is appended. H. DE M. ALEXANDER.

PROGRESSIVE MACULAR DEGENERATION IN THREE MEM-
(717) **BERS OF A FAMILY.** MARCUS FEINGOLD, *Archives of Ophthalmol.*, 1916, xlv., Nov., pp. 533-543 (5 figs.).

THE three patients were children of Russian Jews who were first cousins. Eight of the nine living children were examined, the members affected being Nos. 1, 2, and 6. The condition found is described and illustrated. It was not due to acquired disease, and must be due to some congenital weakness of the macular region. Three stages may be distinguished. The first stage is represented by a purplish-red round spot in the macula with absence of the foveal reflex; the second stage shows a comparatively mild atrophy of the retina and choroid immediately round the foveal area, and in the third stage foci of atrophy show up in other parts of the retina. In each case the changes were exactly symmetrical. No scotomata could be detected. The age of onset in these three cases was uncertain; one case made no complaint about her eyes; the second, in spite of her very advanced fundus condition, had pretty fair vision; and the third case stated that he noticed his distance vision failing when he was about 22 years old. There is no reason to assume congenital syphilis is the cause of the condition. The mother of the parents showed a posterior polar cataract, and all the brothers examined were colour blind (*cf. Review*, 1915, xiii., p. 291). A. NINIAN BRUCE.

A STUDY OF THE MENOPAUSE, WITH SPECIAL REFERENCE
(718) **TO ITS VASOMOTOR DISTURBANCES.** CAREY CULBERTSON, *Surgery, Gynæcology, and Obstetrics*, 1916, xxiii., Dec., p. 667.

CONCLUSIONS:—

1. The menopause is a functional derangement on the part of various endocrine glands subsequent to the cessation of the ovarian secretion.

2. On this basis may be explained the psychic and somatic manifestations of the menopause.

3. The vasomotor disturbances represent an instability of arterial tension: (*a*) In the majority of cases this takes the form of a vacillating hypertension, both systolic and diastolic. (*b*) The diastolic pressure is not elevated proportionately to the systolic.

This produces an increased pulse pressure. (*c*) Hot flushes, sweating, and other vasomotor symptoms are directly created by the vacillations in arterial tension. (*d*) In a minority of cases there is arterial hypotension, and here also the systolic and diastolic pressures are out of proportion.

4. Hypertension is apparently due to a relative over-sufficiency of pituitary and adrenals.

5. The psychic symptoms are apparently influenced by thyroid dys-function; in the majority of cases a hyperthyroidism, in the minority a hypothyroidism.

6. Administration of the missing hormone, represented by the extract of corpora lutea from animals in early gestation, brings about a gradual restoration to normal of the blood pressure with disappearance of the mental symptoms.

7. This reduction of blood pressure by organotherapy together with the disproportionate systolic and diastolic rise is offered as evidence that the hypertension is a functional one and not due to organic changes.

8. Blood pressure estimation is essential, as a means both of measuring the degree of menopause disturbance and of controlling its therapy.

9. An occasional pressure reading is of little or no value. Tension must be determined at frequent intervals, preferably daily until improvement is well under way.

10. The significance of functional hypertension as a factor in uterine hæmorrhage is obvious.

(The paper contains many charts, records of cases, and a good bibliography.) LEONARD J. KIDD.

PSYCHIATRY.

THE CAUSES OF GENERAL PARALYSIS IN RIO DE JANEIRO.

(719) **(Contribuiçao ao estudo das causes da demencia paralytica no Rio di Janeiro.)** J. MOREIRA and U. VIANNA, *Brazil-Medico*, 1916, **xxx.**, p. 299.

As the result of their investigation the writers come to the following conclusions:—

1. In spite of syphilis having been frequent for many years in Brazil, the frequency of general paralysis varies considerably in each state and each city.

2. The climate of Brazil has no influence on the frequency of general paralysis.

3. In the National Lunatic Asylum the absolute number of cases of general paralysis is greater in the indigenous population than in the foreign, but as the indigenous population in Rio is more than

double the foreign, the proportion of indigenous and foreign cases is more or less equal. In Sao Paulo, where the indigenous population is more than three times as large as the foreign, the cases of general paralysis are more frequent among the latter.

4. In Rio, as in the rest of Brazil, there is no racial immunity for general paralysis.

5. Moreira has seen the clinical forms of general paralysis described among the whites in Europe reproduced in the whites, mulattoes, and negroes in Brazil.

6. For many years general paralysis in Brazil was much less frequent in women than it was in certain countries of Europe (*v. Review*, 1912, x., p. 151). Recently this number has increased.

7. In the National Hospital at Rio the majority of cases occur between 35 and 45, but all ages are met with from 15 to 90.

8. All social classes and professions may be affected.

9. As a rule the disease lasts four to five years, but its duration may be much longer or much shorter.

10. Among 200 cases with obvious symptoms of general paralysis, 198 gave a positive Wassermann reaction in the blood and cerebro-spinal fluid. In all there was a lymphocytosis of varying intensity.

11. Among 100 cases of probable general paralysis, 48 gave a negative reaction in the blood, and a positive in the spinal fluid; 42 gave a positive reaction in both blood and spinal fluid; in 8 the reaction was positive only in the blood, and in 2 it was negative both in the blood and spinal fluid. J. D. ROLLESTON.

THE DURATION OF PARESIS FOLLOWING TREATMENT.

(720) W. R. DUNTON, Jun., and G. F. SARGENT, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 241.

THE results obtained by these authors using the Swift-Ellis method have not been specially satisfactory, and are at variance with the results of others. The point which they particularly emphasise is that the duration of cases treated with salvarsan is less than normal, and the following interesting table is reported, showing the average duration of cases of paresis following different forms of treatment:—

S.E.	Hg.	Hg and KI.	KI.	General.
10 cases, 1 yr. 9⅓ mts.	10 cases, 4 yrs. 1 mt.	4 cases, 3 yrs. 3 mts.	11 cases, 4 yrs. 2 mts.	6 cases, 4 yrs. 42 cases, 3¼ yrs. 48 cases, 3¾ yrs.

D. K. HENDERSON.

TREATMENT OF CEREBRO-SPINAL SYPHILIS, WITH REPORT
(721) **OF CASES.** L. W. GROVE, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 253.

UNDER the above term are included cases of general paresis, tabo-paresis, tabes, and localised lesions formerly designated as cerebro-spinal syphilis.

Both salvarsan and mercurialised serum have been used.

Out of nine cases of paresis three have been discharged as clinically well, with a negative or slightly positive spinal fluid; two have been much improved, but with spinal fluid still positive; four have not improved.

Out of six cases treated with salvarsan intradurally four have shown bladder and bowel paralysis. D. K. HENDERSON.

SYPHILIS IN THE EAST LOUISIANA HOSPITAL FOR THE
(722) **INSANE.** CHARLES S. HOLBROOK, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 261.

THIS report is based on approximately 2,000 Wassermann reactions performed on 1,600 inmates. Of 1,153 white patients, 6 per cent. gave a positive reaction, while 9 per cent. of the 447 negroes gave a positive reaction.

Of the total number of patients received during the past ten years, 8·5 were paretics. D. K. HENDERSON.

DEMENTIA PRÆCOX STUDIES: THE RELATION OF CECAL
(723) **STASIS TO DEMENTIA PRÆCOX.** BAYARD HOLMES and JULIUS RETINGER, *Med. Record*, 1916, May 6.

CECAL STASIS WITH BETAIMINAZOLYLETHYLAMINE (HIS-
(724) **TAMIN) INTOXICATION IN RELATION TO DEMENTIA PRÆCOX: INDICATIONS FOR TREATMENT.** BAYARD HOLMES, *Amer. Med.*, New Series, Vol. XI., No. 6, 1916, June, p. 405.

THE RELATION OF CECAL STASIS TO DEMENTIA PRÆCOX.
(725) BAYARD HOLMES and JULIUS RETINGER, *Lancet-Clinic*, 1916, Aug. 12.

THESE three papers are complementary. In the entire United States not less than fifteen thousand youths suffering from dementia præcox are annually committed to the State hospitals, and as many more are kept in private institutions or at home. The average life of a case of dementia præcox, after admission to an asylum in the State of New York, is fifteen years. The ætiology, pathology, and treatment of the disease are equally undecided.

The authors, finding that the blood pressure in dementia præcox was, as a rule, low, and that the great majority of such cases exhibited paradoxical manifestations, both in the pressor action of adrenalin injected into a muscle or vein, and in the pupillary condition when adrenalin is instilled into the conjunctival sac, were impressed with the fact that these phenomena were similar to the reactions that appear in animals poisoned with ergot or with any of the toxic amins. They therefore examined the stools of seven cases of dementia præcox and one case of tabes with gastric crisis, and found a considerable amount of histamin, the toxic amin which produces reactions most resembling the common symptoms of dementia præcox. Controls gave negative results. Finding that an injection of adrenalin instantly relieved the pain in a case of tabetic gastric crisis, and that the blood pressure fell, "and did not begin to rise for fifty minutes, and not until then did the pain return. A tender spot on the right side of the abdomen became prominent, we noticed relaxation of the abdominal wall, and the distal colon seemed to fill." The authors took up this clue, and having administered a barium meal to seven præcox patients, examined the motility of their intestinal tracts by the fluoroscope and skiagraph. They found evidence of considerable cecal stasis, thus producing a nidus for the development of the toxic amins. The conditions demonstrated by the fluoroscopic examinations were consistent with spasm of the sphincter of the colon. Dr Holmes is of opinion that treatment should be directed to the prevention of the production of this cecal stasis, and, until further research has developed a simpler method, advocates appendicostomy with protracted irrigation of the proximal colon through this artificial opening. H. DE M. ALEXANDER.

DEMENTIA PRÆCOX STUDIES: SAL-LAMZIEKTE METHODS
(726) **AND MOTIVES OF RESEARCH ILLUSTRATED.** BAYARD HOLMES, *Chicago Medical Recorder*, 1916, April.

FOR years the farmers of the South African Union have been harassed by the cattle disease known as "sal-lamziekte" (a Dutch word meaning the paralysing sickness). The symptoms of the acute and chronic forms of the disease are described. The author illustrates how minor research, carried out for twenty years, working on the theories prevalent as to the cause of the disease, has utterly failed to elucidate its ætiology or promote its cure. The solution lies in major research. The scientific discoverer cannot be ordered to discover any definite thing, he must be given free rein to go ahead on a problem, and discover what he can concerning it. H. DE M. ALEXANDER.

ENVIRONMENTAL ORIGIN OF MENTAL DISEASE IN CERTAIN FAMILIES. L. VERNON BRIGGS, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 223.
(727)

A STATISTICAL, unsatisfactory, and indefinite paper, from which nothing of any special importance can be drawn.

D. K. HENDERSON.

REACTION TIME IN NERVOUS AND MENTAL DISEASES. E. W. SCRIPTURE, *Journ. Ment. Sci.*, 1916, Oct., p. 698.
(728)

THE ordinary methods of taking measurements of reaction time are too cumbersome for clinical use, and the author has devised a self-recording method that shows directly to the eye without measurement just how quick the reaction time is, and just how it varies. The whole series of experiments in all their details is fixed in a few minutes on a surface of smoked paper carried on a drum worked by clockwork. The actual reaction times can be obtained accurately by measuring the automatic record at the observer's convenience. The apparatus is described, and tables and illustrated records are appended showing results obtained in normal persons, cases of alcoholism, hysteria, epilepsy, and general paralysis.

By elaboration of the forms of reaction the author is of the opinion that the reaction test can be made so complete and reliable that a diagnosis of epilepsy, hysteria, general paralysis, &c., can be obtained as surely and accurately as one of diabetes or chronic nephritis from a urinary analysis.

H. DE M. ALEXANDER.

SEQUIN AND PHYSIOLOGICAL EDUCATION. G. E. SHUTTLEWORTH, *Journ. Ment. Sci.*, 1916, Oct., p. 720.
(729)

THE principles Sequin laid down some seventy years ago apply to a far wider range than the instruction of imbeciles, and his master mind anticipated many of the modern methods which of late years have been accepted by the educational world as recent discoveries—these principles were founded on the following axioms:—

1. That if we could take hold of an organ, we would be able to make it produce its function.

2. That the organs of sensation being within our reach, and

those of thought out of it, the former are the first we can set in action.

3. (Consequently) the physiological education of the senses must precede the psychical education of the mind; and the education of the senses is the royal road to the education of the intellect; experience, not memory, the mother of ideas.

Sequin's method with defectives was firstly to exercise the imperfect organs so as to develop their functions, and secondly to train the functions so as to develop the imperfect organs.

The paper contains a few interesting biographical particulars and personal reminiscences by the author. Sequin advocated open-air teaching in schools in 1878. H. DE M. ALEXANDER.

UNFITNESS TO PLEAD IN CRIMINAL TRIALS. M. HAMBLIN (730) SMITH, *Journ. Ment. Sci.*, Oct. 1916, p. 763.

THE subject of this paper is the criteria of an accused person's fitness to plead to an indictment charging him with some criminal offence, and the mental questions on arraignment are solely concerned with the state of the mind at the time of arraignment.

In order that a prisoner may properly be allowed to plead, he must understand that he is on his trial, and for what offence he is being tried, and be able to appreciate the difference between a plea of "guilty" and of "not guilty." He must have a reasonably clear idea of the proceedings against him at the trial, and of their meaning and effect. Acute insanity would justify a verdict of "insane on arraignment." The difficulty arises in cases of undeveloped insanity. A man (*e.g.*, a paranoiac) may be found "guilty but insane" at his trial and yet be fit to plead, and a person may be insane at the time of the crime and yet recovering at the time of the trial—cases of puerperal infanticide.

With deaf mutes the only thing to be done is to prove whether there is any means of communicating with them. Idiots, imbeciles, and many cases of "feeble-mindedness" would be found insane on arraignment.

No general rule can be laid down as to the degree or character of mental disease or defect which renders a person unfit to plead, any more than an absolute rule can be made as to the degree of mental derangement which renders a person "irresponsible for his criminal actions." Consider each case on its merits.

In many cases inquiry will be futile (especially in some cases of epilepsy) unless there is discussion of the circumstances of the crime with the prisoner. H. DE M. ALEXANDER.

THE PSYCHOGRAPH OF ROSSOLIMO. BERYL PARKER, *Amer. Journ.* (731) *Insanity*, 1916, lxxiii., Oct., p. 273.

THIS method of studying the mental status of the individual is based on the investigations of nine mental processes, viz.:—

I. Tonus.
   1. Attention.
   2. Will.
II. Impression.
   3. Perception.
   4. Memory.
III. Associative processes.
   5. Comprehension.
   6. Construction, ability to combine.
   7. Skill in mechanics.
   8. Imagination.
   9. Observation.

The tests and technique are fully described. The author, in criticising the tests, praises them for their completeness, but feels that "they are manifestly too voluminous for practical use."

D. K. HENDERSON.

ART IN THE INSANE. C. B. BURR, *Amer. Journ. Insanity*, 1916, (732) lxxiii., Oct., p. 165.

THE author distinguishes three main groups:—

The imitative, crude, and childlike.

That of genuine value and individuality, the result of temperamental conditions and previous education in artistic lines.

The symbolic and effective.

It is the third group which is here specially considered, and an attempt is made to interpret the symbolism in a series of sketches and drawings which are reproduced. D. K. HENDERSON.

WHAT THE STATE HOSPITAL CAN DO IN MENTAL HYGIENE. (733) W. L. RUSSELL, *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 157.

THE author deplores the fact that so little contact exists between the State hospital and outside physicians and agencies. The knowledge and skill of physicians engaged in psychiatric work in State hospitals should be brought to bear on the problem of mental disorders as it exists in the home, and in society. In this way the practice of psychiatry will be brought into touch with conditions which are remediable. After-care agencies and out-patient departments in connection with State hospitals are especially recommended. D. K. HENDERSON.

Reviews

THE DEVELOPMENT OF INTELLIGENCE IN CHILDREN. The Binet-Simon Scale. ALFRED BINET, Sc.D., and TH. SIMON, M.D. Translated by ELIZABETH S. KITE. Pp. 306. Publications of the Training School at Vineland, New Jersey, Department of Research. No. 11, May 1916. Williams & Wilkins Company, Baltimore. Pr. $2·00.

(734)

THE INTELLIGENCE OF THE FEEBLE-MINDED. ALFRED BINET, Sc.D., and TH. SIMON, M.D. Translated by ELIZABETH S. KITE. Pp. 328. Publications of the Training School at Vineland, New Jersey, Department of Research. No. 12, June 1916. Williams & Wilkins Company, Baltimore. Pr. $2·00.

(735)

THESE two volumes, which have just been translated by Miss Kite under the auspices of Dr Goddard at the Training School, Vineland, New Jersey, are contributions of considerable value to the subject of mental deficiency. The first volume comprises the complete writings of Binet and Simon relative to their scale, while the second volume gives their own application of their scale to the problem of feeble-mindedness.

The Measuring Scale of Intelligence was not merely an incidental chapter in Binet's work. It was his *magnum opus*. His contributions on this subject appeared in different numbers of *L'Année Psychologique* in 1905, 1908, and 1911. These have been here translated and collected together into one volume, and comprise five separate papers. The first deals with the earlier and pioneer work necessary to establish a scientific diagnosis of inferior states of intelligence, and shows the origin of the scale and the first methods of attacking the problem. The second paper describes these first results, namely, a series of test questions arranged in order of difficulty, but not yet assigned to definite years. This resulted in the so-called "1905 tests," and involved an immense amount of work, much of which was later discarded for a more useful plan. The conclusions arrived at may be summed up as follows:—Three methods may be utilised for the diagnosis of the intellectual level among subnormals: (1) the *psychological method*, which is almost always applicable, and which is most *certain* to reveal the signs of defect; (2) the *pedagogical method*, which is very frequently applicable, and which reveals *probable* signs of defect; and (3) the *medical method*, which is applicable only in a restricted number of cases, and reveals

possible signs of defect. The third paper shows the completion of this preliminary work, the process of standardisation, and the demonstration from the study of normals, sub-normals in institutions and sub-normals in primary schools that it is of practical value, as well as the methods which must be used in all extensions and revisions of the scale. The fourth paper is the most complete statement of the scale, and gives us the so-called "1908 scale." It shows in a more positive manner than previously that psychology is "in a fair way to become a science of great social utility." The last paper gives some of his later 1911 corrections and revisions, and discusses many important points in this connection, *e.g.*, what modifications should be introduced into the series of tests? what are the existing relations between the intellectual level and the scholastic level? what modifications are presented by testing the intellectual level of a given child at intervals of fifteen days? how can teachers estimate the intelligence of a child? what differences exist in the intelligence of children belonging to different social conditions? &c. It concludes with a review of recent criticisms of the accuracy of the scale.

The second volume contains three papers, published also in *L'Année Psychologique* during 1908 and 1909, which deal in turn with (1) the intelligence of the feeble-minded; (2) the language of the feeble-minded; and (3) feeble-mindedness and dementia, and which afford further illustration of the way in which Binet used his own measuring scale. He points out that it is now possible to fix within a few months at least the *age of the intelligence* of defectives, and as it is possible with good reason to consider a certain idiot of thirty years as the equivalent of a child of one, or an imbecile of twenty as the equivalent of a child of six, &c., and as these defectives are just so many children arrested in a certain phase of their development, we have only to arrange them in an ascending series of evolution, in order to obtain the psychogenesis of intellectual functioning. Another means is thus obtained of developing and perfecting former investigations on children, and to trace the mental evolution of character, attention, effort, association of ideas, intellectual activity, reasoning, suggestibility, and docility, &c., and by synthesising them to discover exactly in what mental development consists, by what mechanism it is produced, and how a superior intelligence differs from an inferior one. A particularly interesting chapter in this part deals with suggestibility and its relation to docility. The second paper deals with the language of the feeble-minded by the *psychogenetic* method, and brings forward many interesting facts about aphasia, the relation between aphasia and the poverty of language of the low grade imbecile, the evolution of language, the relation between language and thought, and many other points. It is concluded

that thought is formed by means of an intellectual feeling, and may exist without images and without words. The third paper, upon feeble-mindedness and dementia, discusses the intellectual weakening in general paralysis and in senile dementia. These two forms of dementia correspond to a lowering of intelligence which is measurable; from this comes the practical conclusion that dements are unable to adapt themselves any longer to the ordinary condition of life, and have need of the simpler life of the hospital. Senile and paralytic dementia belong to the category of deficient mental states, which differ from the normal by the absence, or gap, or weakness of certain integral parts of the normal mechanism. The difference between dements and defectives is that in the one there is inertia of functioning, and in the other an insufficiency of development. Binet's work consisted in putting precision into this statement, and in showing that the inertia of functioning consists in a weakness of the evocation of the states of consciousness, and that the lack of development is manifested in the quality of the states of consciousness, which are not sufficiently differentiated.

In a short review like this it is not possible to do full justice to such important work as this. The work of Binet represents the most important and enlightening work on the real nature of the mental defective which has yet appeared, and it is interesting to note that such an unbiased and independent observer as Dr Goddard should state that his own findings have confirmed the accuracy of almost everything that Binet had already described. No one interested in feeble-mindedness can afford to neglect these two books. They merely need to be read to be appreciated, and their translation, which has been well done, cannot but add to the high reputation which the Training School at Vineland is rapidly winning for itself in this department of medicine.

PSYCHOLOGY OF RELAXATION. G. T. W. PATRICK. Pp. x+280. (736) Constable & Co., Ltd., London, and Houghton Mifflin Co., Boston and New York. 1916. Pr. 5s. net.

UNDER the title of the "Psychology of Relaxation" we have here collected together five essays dealing in turn with the psychology of play, of laughter, of profanity, of alcohol, and of war. The reason that subjects so apparently unlike as these are here brought together is because they all, in their separate ways, represent relief from tension or release from some form of restraint. According to the view here expressed the repression of primitive impulses is the fundamental law of human progress, and such continual repression necessitates constant effort, constant strain,

and constant exercise of voluntary attention. It involves specially those higher brain centres whose development has conditioned human progress, causing a severe and constant strain, making rest and relaxation imperative. Laughter represents a sudden momentary and unexpected release from the tension with reinstatement of primitive forms of expression. Play or sport are daily or systematic returns to primitive forms of activity. Profanity is a resort to primitive forms of vocal expression to relieve a situation which threatens one's well-being, but is accompanied by a certain feeling of helplessness. The psychological value of an oath depends upon the "shock" which it is capable of giving to the opponent, and acts as a safety-valve. The individual revels in an outburst of primitive language, giving him a certain sense of release and escape from the constant inhibitions which society demands. Alcohol is an artificial means of relieving mental tension by the narcotizing of the higher brain centres. From the fact that in his essay upon the psychology of war the author states that in the present war there are "no great moral issues involved," it will be seen he is not competent to discuss this question, a fact which many other statements in this chapter confirm.

The connecting idea which links together these several themes is the *catharsis* idea, to which he gives a special interpretation. He concludes by expressing a doubt whether the development of the higher brain can be carried any further without defeating its end, as it is attained by a sacrifice of stability and permanence leading to a lack of biological fitness, or of physiological adjustment, in which lies the source of many of our social ills.

THE DRINK PROBLEM OF TO-DAY in its medico-sociological aspects. Edited by T. N. KELYNACK, Hon. Secretary of the Society for the Study of Inebriety. Pp. xii+318. Methuen & Co., Ltd., London. 1916. Pr. 7s. 6d. net.

(737)

THE drink problem is essentially a medico-sociological problem, and requires to be studied from many points of view. The purpose of this volume is "to indicate the lines along which inquiry into the problems of alcoholism may most advantageously proceed, to summarise the more important facts hitherto established regarding alcohol and alcoholism, and to enunciate the guiding principles which should direct in further investigations, and in all attempts to apply knowledge, influence, and all other powers to rational measures making for practical reform."

The inebriate is a disordered unit of the community, who, by his disorder and its consequences, brings derangement and loss

not only upon himself and his own affairs, but upon his family, his associates, and ultimately upon the community as a whole. The inebriate class forms a large and important section of the great body of human derelicts, the defectives, dependents, and delinquents, who have to be borne as a heavy burden by the efficient and reliable members of the State. Inebriety is, in fact, an anti-social influence.

The book consists of fourteen chapters, all written by different authors of repute. In Chapter I. Dr Harry Campbell discusses the biology of alcoholism. He considers that alcohol and agriculture probably made their appearance together about thirty thousand years ago. The second chapter, by Professor Sims Woodhead, deals with the pathology of alcoholism. He points out that alcohol contributes to the degeneration of nerves, muscles, and epithelial cells, it helps the accumulation of waste products in the tissues by paralysing the tissue cells, interferes with oxidation, secretion, and excretion; it also interferes directly with the production of immunity against specific infective disease, and impairs the resistance of tissues to disease already in the body. "Alcohol lowers vitality, impairs judgment, sterilises initiative, absorbs wealth, vitiates morality and, in raising the morbidity-rate, increases the death-rate." The psychology of alcoholism is explained by Dr Claye Shaw.

The medico-legal relations of alcoholism are described by Sir William Collins, who points out that the law in relation to alcoholism is in a transitional and rather inchoate condition. Under the title of alcohol and life assurance Mr M'Adam Eccles and Mr William Bingham conclude, that "those who don't drink don't die so fast." Mrs Mary Scharlieb has charge of the chapter on alcoholism in relation to women and children. Dr Sullivan discusses alcohol and crime, and finds that alcoholic intoxication is answerable for about 60 per cent. of indictable crimes of violence, and for a rather higher proportion of minor offences of the same class. There then follow a series of chapters upon alcohol and poverty by the Rev. J. C. Pringle, upon alcohol and national efficiency by Dr Armstrong-Jones, upon alcohol and work by Sir Thomas Oliver, upon alcohol and war by Sir Alfred Pearce Gould, upon alcoholism and legislation by Sir Thomas Whittaker, and upon the educational development of national sobriety by John Turner Rae. The book concludes with a chapter upon the arrest of alcoholism.

It will be obvious from the above list that the value of this book, as a serious contribution to the subject of the drink problem, is very great and worthy of close and careful study. It appears at an appropriate time when the war is bringing this problem so prominently forward, and when the urgent need of further

legislation is being urged from many different points of view. The arguments produced here help greatly in a clearer understanding of many of the fundamental factors of the question, and deserve wide circulation and recognition.

Obituary.

SIR VICTOR HORSLEY, C.B., F.R.S., M.B., F.R.C.S.,

Consulting Surgeon, University College Hospital, and the National Hospital for the Paralysed and Epileptic, Queen Square; Colonel, A.M.S.

By his death in Mesopotamia the world has lost one of the greatest surgeons of the day, and science has been robbed of one whose brilliant achievements in the field of experimental physiology will live for all time.

In no branch of medicine will his loss be more felt than in that of neurology, where his position was unique, and where his experimental researches yielded results which added so extensively to our knowledge of the physiology and pathology of the nervous system, where, as a pioneer in the surgery of the brain and spinal cord, he brought the results of his investigations to bear on his clinical work with such striking and lasting effect.

Victor Alexander Hadon Horsley was born in 1857, and was the son of John Callcott Horsley, R.A. He was educated at Cranbrook School and University College and Hospital, and graduated M.B., B.S. Lond. in 1881, being scholar in surgery and gold medallist. He became F.R.C.S. Eng. in 1883, and two years later still he was appointed Professor of Pathology in the college, a post which he continued to hold until 1896, and he became Professor of Clinical Surgery in 1899.

He married the daughter of Sir Frederick Bramwell in 1887

and is survived by her, two sons, who obtained commissions in the Army early on in the war, and a daughter.

He was appointed Professor Superintendent of the Brown Institution in 1884, and held this post until 1890, and included among the investigations which he carried out there were those which resulted in the discovery of the cause and cure of myxœdema.

In 1885 he was appointed Secretary to the Royal Commission on Hydrophobia, and in the following year he was elected Fellow of the Royal Society, and was appointed Surgeon to the National Hospital for the Paralysed and Epileptic, Queen Square, where he performed his first operation for a tumour of the brain, which he successfully removed; while in a publication in conjunction with the late Sir W. Gowers, in 1887, is to be found a record of the classical case in which, for the first time, a tumour of the spinal cord was successfully removed.

In conjunction with Professor Gotch he delivered the Croonian Lecture of the Royal Society in 1891, and from this year until 1893 held the post of Fullerien Professor at the Royal Institution.

He was awarded the Cameron Prize for therapeutics by the University of Edinburgh in 1893, and was awarded the Royal Medal of the Royal Society in 1894, and the Fothergillian Medal of the Medical Society of London in 1896.

He received the honour of knighthood in 1902, and in recognition of his services with the Mediterranean Expeditionary Force he received the C.B. while on active service.

Victor Horsley was a great man, as no one could doubt who was privileged to be present on a memorable occasion when, at an International Medical Congress, he addressed a large hall filled to overflowing with medical men congregated from all parts of the globe. The ovation he received made it abundantly evident that the world of scientific medicine and surgery acclaimed him as such. His appearance on the platform was the signal for round after round of deafening applause, which became hushed into a silence profound, and every ear was intent on losing nothing of what he had to say as he told of his brilliant achievements in the surgery of the brain. It was not only in brain surgery that Horsley excelled, however, for he was one of the pioneers in surgery in general, and no department of this field of work was neglected by him, so that no matter what the condition to be dealt

with, he was always able to bring the most modern and up-to-date principles to bear in the diagnosis and treatment of the affection, whether by operation or otherwise.

He was a surgeon of altogether exceptional qualities, for he brought to his practical work a mind trained in scientific methods of investigation, so that diagnosis was always based on scientific principles, while the dexterity and precision with which he performed his operations evoked admiration from all who were privileged to see him at his work, and medical men flocked from all parts of the civilised world to witness these brilliant performances. Busy as he always was, he nevertheless always had time to receive such men with a kindness and hospitality that they could never forget.

He was an enthusiastic advocate of Lister's methods, and a great admirer of Marcus Beck, who did so much to establish the principles of Listerism.

A notable feature in his surgical work was his abhorrence of inflicting pain, so that he would do everything in his power to prevent pain, and to relieve the sufferings of his patients. His delicacy of touch must be the cause of grateful remembrance to many of his patients, and not only was he careful to avoid causing pain, but even discomfort was guarded against, so that he would spare no pains in the dressing of a patient after an operation to be sure that every comfort was secured, and no source of discomfort was allowed to arise that could be prevented by any device of his.

Horsley never departed from the principles which he always insisted on, that experimental research is a necessary condition for the progressive study of surgery. So keenly had he his scientific work at heart, that even when the calls on his time became so numerous that he could only devote the early hours of the morning to his researches in the laboratory, he set aside Saturdays for this work, and would never allow his private practice or any other calls to encroach on the time set aside for his researches. It was only when in later years he felt that it was his duty to devote more time to public questions that engaged his attention, and to certain reforms which seemed to him imperative, that he was compelled to sacrifice to these objects the time that had hitherto been strictly safeguarded in the interests of science.

Few men have had developed in them to so great degree that electric personality that proved so stimulating to others, so that

to be associated with him in his work proved most exhilarating. It would have required a person of very peculiar temperament who could long have remained sluggish in the presence of and under the influence of his stimulating personality, for so eager was that keen intellect that it was impossible for others associated with him not to become imbued with the same spirit of enthusiasm for work.

Not only did he engender in others a keen desire to emulate his example in the enthusiasm in carrying out investigations on which they were engaged in his laboratory, but he also devoted an endless amount of his precious time to devising experiments for them, and in assisting them to carry their researches to a successful issue. Many of the works that emanated from his laboratory would never have been possible had it not been for this unselfishness on his part, for to permit of the investigations a surgical procedure of intricate character was often required, such as only a skilled surgeon could have undertaken with any chance of success. Nothing was ever too much trouble, and no matter how small the research or how insignificant the investigator, he was always ready to assist him in every way in his power to achieve the object he had in view.

Nothing did Horsley impress more on those who worked with him than the need for the multiplication of experiments before any results could be accepted as proved, and he also insisted on the great importance of instituting a variety of control experiments so as to reduce the possibility of fallacies to a minimum.

His unselfish kindness was only equalled by his generosity, as no experiment was ever abandoned in his laboratory owing to the need of adequate apparatus, for he liberally bore an expense which it is to be hoped will before long be borne by the State under similar circumstances.

No one can be said to know Horsley who had not the privilege of working with him in his laboratory, in his hospital, or in private practice, and not even all of these can be said to really know him to the full, for it was to those who had the entrée to his private residence that was reserved the possibility of a thorough knowledge of the real worth of the man, and the extreme versatility of his brain. How largely Horsley must have read outside the literature of his profession was evidenced from the way in which he could enter into conversation with anyone, and discuss

with ease subjects with which they were familiar, and which did not come within the scope of his ordinary work.

Most men prefer the seclusion of their study in which to work. Not so Horsley: it mattered little to him how many were about him when he was engaged in his writing, so that he constantly worked in his drawing-room with his children and others about him, taking part in their conversation and interests, instead of retiring to his study. It was also remarkable to see him at times engaged in the writing of a paper himself, and at the same time directing others in similar or other work on which they were engaged, work which often concerned them and not him, and which called for an entirely different line of thought to that necessitated by the work on which he was himself engaged. Thus it would come about that those engaged in research in his laboratory would be instructed how to group their facts, draw their conclusions, and present the fruits of their researches for publication.

Just as in the laboratory nothing was too much trouble when assisting others with their experimental investigations, so in his drawing-room his time was never too precious for him to give liberally of it to all who were engaged on writing papers, embodying the results of their investigations for publication.

Was it to be wondered at that all who were privileged to really know him loved Horsley with an affection that made it difficult for them to hear without feelings of resentment the adverse criticism in his public life from men who were not in a position to understand his real worth, and who could not be expected to know or appreciate the real motives which induced him to champion this or that cause? No seeking after self-aggrandisement induced him to throw all his energies into a discussion of this or that problem; one motive, and one alone, actuated him in doing whatever he did—was a thing right or was it wrong? Having made up his mind on this point, he would leave nothing undone to vindicate the right and crush the wrong, without in the least taking into account what effect his actions might have on his own reputation and career.

Archæology was a passion with him, and he never missed an opportunity of visiting some old church or Roman remains, in which he revelled. No greater treat could have been afforded to anyone interested in such subjects than that he should have been his companion on such excursions.

It was fitting that one who had devoted so much time to the experimental study of the effects of gunshot wounds of the brain should have taken a prominent part in the present war. It is, however, much to be regretted that he could not be dissuaded from going to a climate like that of Mesopotamia, for the British Empire could ill afford to lose Horsley. He felt that it was his duty to go there, and nothing could deter him; and it is strictly in keeping with his life's history that he should have sacrificed himself in this way in the interests of his country, and in his attempts to alleviate human suffering. How fatigued he must have been when, after tramping across an open plain with a temperature of 110° in the shade, he reached his tent, is self-evident, and yet he set out again to the assistance of a sick officer further on, regardless of what the effect might be on himself.

J. S. RISIEN RUSSELL.

BOOKS AND PAMPHLETS RECEIVED.

Lugaro, Ernesto. "An Emperor's Madness, or National Aberration?" translated by W. N. Robinson, M.D. Pp. 135. George Routledge & Sons, Ltd., London, 1916. Pr. 2s. 6d. net.

Smith, R. Percy. "Mental Disorders in Civilians arising in Connection with the War." (Presidential Address to Section of Psychiatry of the Royal Society of Medicine, October 31, 1916.)

"The State Hospital Quarterly." 1916, ii., November. (Published by the New York State Hospital Commission.)

"The Training School Bulletin." 1916, xiii., December.

Bibliography

ANATOMY.

BARTLETT, C. S. Direct union between adrenals and kidneys (subcapsular location of adrenals). *Anat. Record*, 1915, x., Dec. 20, p. 67 (5 figs.).

PHYSIOLOGY.

NAGEOTTE, J. Développement de la gaine de myéline dans les nerfs périphériques en voie de régénération. *Compt. Rend. d. l. Soc. de Biol.*, 1915, lxxviii., p. 611.

MILLER, F. R., and BOWMAN, J. T. The cardio-inhibitory centre. *Amer. Journ. Physiol.*, 1915, xxxix., p. 149.

FORBES, A., and GREGG, A. Electrical studies in mammalian reflexes.—II. The correlation between strength of stimuli and the direct and reflex nerve response. *Amer. Journ. Physiol.*, 1915, xxxix., p. 172.

PORTER, W. T., and TURNER, A. H. Further evidence of a vasotonic and vaso-reflex mechanism. *Amer. Journ. Physiol.*, 1915, xxxix., p. 236.

KURODA, M., and KUNO, YAS. Note on vagus stimulation of the adrenalised heart. *Journ. of Physiol.*, 1915, l., Dec. 26, p. 154.

HOSKINS, R. C. A note on the failure of pituitrin to sensitise the sympathetic system. *Proc. Soc. for Exp. Biol. and Med.*, 1915, xiii., 12 (1076).

M'CORD, CAREY PRATT. The occurrence of pituitrin and epinephrin in fœtal pituitary and suprarenal glands. *Journ. Biol. Chem.*, 1915, xxiii., Dec., p. 435.

PSYCHOLOGY.

MOTT, FREDERICK W. The psychic mechanism of the voice in relation to the emotions. *Brit. Med. Journ.*, 1915, Dec. 11, p. 845.

PATHOLOGY.

M'JUNKIN, FRANK A. A polychrome stain with advantages over the Giemsa. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2164.

DONALDSON, H. H., HATAI, S., and KING, H. D. Post-natal growth of the brain under several experimental conditions. Studies on the albino rat. *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 797.

CLINICAL NEUROLOGY.

GENERAL—

EVANS, J. JAMESON. Organic lesions from shell concussion. *Brit. Med. Journ.*, 1915, Dec. 11, p. 848.

BENNETT, F. D. Bilateral iridodialysis with amblyopia and contracted fields due to exploding shrapnel. *Brit. Med. Journ.*, 1915, Dec. 11, p. 848 (with chart).

SPINAL CORD—

General.—HOLMES, GORDON. The Goulstonian lectures on spinal injuries of warfare. *Brit. Med. Journ.*, 1915, Dec. 4 and 11, pp. 815 and 855 (illust.).

HEARD, WM. HAUGHTON. Case of malarial fever with motor paralysis of the legs. *Journ. Trop. Med. and Hygiene*, 1915, xviii., Dec. 1, p. 271.

Landry's Paralysis.—FISHER, E. D. Landry's paralysis: report of a case, with necropsy and histopathological findings. *Amer. Journ. Med. Sci.*, 1915, cl., Dec., p. 791.

BRAIN—

Neurofibromatosis.—BASSOE, PETER, and NUZUM, FRANK. Report of a case of central and peripheral neurofibromatosis. *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 785.

Meningitis.—STEWART, C. ALWYN. Cerebro-spinal meningitis. *Med. Journ. Australia*, 1915, ii., Nov. 6, p. 435.

BULLEN, N. J. Cerebro-spinal meningitis in children. *Med. Journ. Australia*, 1915, ii., Nov. 6, p. 438.

WEBSTER, REGINALD. The pathology and bacteriology of epidemic cerebro-spinal meningitis. *Med. Journ. Australia*, 1915, ii., Nov. 6, p. 440.

DUHOT, E., and BOEZ, L. Méningite cérébro-spinale à méningocoques et colibacilles associés évoluant vers la mort chez une femme enceinte. Acétone dans l'urine et le liquide céphalo-rachidien. *L'Encephale*, 1915, ix.-x., Dec., p. 175.

ELLIS, A. W. M. A classification of meningococci based on group agglutination obtained with monovalent immune rabbit serum. *Brit. Med. Journ.*, 1915, Dec. 18, p. 881.

ARKWRIGHT, JOSEPH A. Grouping of the strains of meningococcus isolated during the epidemic of cerebro-spinal meningitis in 1915. *Brit. Med. Journ.*, 1915, Dec. 18, p. 885.

Hemiplegia.—FRANZ, SHEPHERD IVORY, SCHEETZ, M. E., and WILSON, ANITA A. The possibility of recovery of motor function in long-standing hemiplegia: a preliminary report. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2150.

Tumour.—BURMEISTER, W. H. A mixed tumour (chondro-fibro-epithelioma) of the choroid plexus. *Bull. Johns Hopkins Hosp.*, 1915, xxvi., Dec., p. 410 (illust.).

BROWN, S. H. Metastatic carcinoma of the brain with unusual ocular symptoms; clinical history and autopsy report of a case. *Med. Record*, 1915, lxxxviii., Dec. 18, p. 1046.

Pituitary Disease.—TIMME, WALTER. Pituitary disease: the interpretation of its clinical manifestations. *Med. Press*, 1915, cli., Dec. 1, p. 515.

Cerebellum.—WILSON, J. GORDON, and PIKE, F. H. The differential diagnosis of lesions of the labyrinth and of the cerebellum. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2156.

Progressive Lenticular Degeneration.—RHEIN, JOHN H. W. Extra-pyramidal motor disturbances: a report of a case with autopsy. Lenticulo-rubro-cerebello-olivary degeneration. *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 802.

Pellagra.—HENDERSON, D. K. Pellagra. *Review of Neurol. and Psychiat.*, 1915, xiii., Dec., p. 5.

LAVINDER, C. H. The history of pellagra. *N.Y. Med. Journ.*, 1915, cii., Dec. 11, p. 1169.

Beri-Beri.—WALCOTT, ALLEN M. Beri-beri in the Amazon basin. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2145.

Frost-Bite.—DELÉPINE, S. Some of the effects of exposure to wet cold and their prevention. (Prevention of "frost-bite," "trench-foot," and "water-bite.") *Brit. Med. Journ.*, 1915, Dec. 18, p. 888.

MONROE, H. E. The character and treatment of frost-bite. *Brit. Med. Journ.*, 1915, Dec. 25, p. 926.

Lead Poisoning.—RUSSELL, J. Basophilia in lead poisoning. *Journ. State Med.*, 1915, xxiii., Dec., p. 359.

Syphilis.—POST, ABNER. Medical and social aspects of syphilis of the nervous system. *Boston Med. and Surg. Journ.*, 1915, clxxiii., Dec. 9, p. 867.

BAZELEY, J. H., and ANDERSON, H. M. Mental Features of Congenital Syphilis. *Boston Med. and Surg. Journ.*, 1915, clxxiii., Dec. 23, p. 952.

HASSIN, G. B. The intraspinal arsenic treatment of syphilis. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 11, p. 2078.

WHITNEY, J. L., and BALDWIN, W. I. Syphilis of the spine: its frequency and the value of its characteristic lesions as a diagnostic sign of syphilis. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 4, p. 1989.

WRIGHT, HELEN M. Examination and prophylaxis for syphilitic patients and their families: methods of investigation at the Psychopathic Hospital, Boston, Massachusetts, 1915. *Boston Med. and Surg. Journ.*, 1915, clxxiii., Dec. 9, p. 869.

SPENCE, HAROLD. Clinical results of 1,000 intravenous injections of galyl. *Lancet*, 1915, clxxxix., Dec. 11, p. 1292.

Salvarsan.—DENNY, CHAS. F. A salvarsan apparatus. *Boston Med. and Surg. Journ.*, 1915, clxxiii., Dec. 23, p. 961.

Cerebro-Spinal Fluid.—HOPKINS, A. H. The "sugar" content of the spinal fluid in meningitis and other diseases. *Amer. Journ. Med. Sci.*, 1915, cl., Dec., p. 847.

MILLER, R., BRUSH, N. D., HAMMERS, J. S., and FELTON, L. D. A further study of the diagnostic value of the colloidal gold reaction, together with a method for the preparation of the reagent. *Bull. Johns Hopkins Hosp.*, 1915, xxvi., Dec., p. 391 (illust.).

SOLOMON, HARRY C., KOEFED, HILMAR O., and WELLES, E. S. Diagnostic Value of Lange's Gold Sol Test. *Boston Med. and Surg. Journ.*, 1915, clxxiii., Dec. 23, p. 956.

BLOCH, LEON. Trichinosis: report of a case with the trichina larvæ in the spinal fluid. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2140.

Wassermann Reaction.—SHEARMAN, CYRIL H. The Wassermann reaction as an aid to diagnosis. *Med. Journ. Australia*, 1915, ii., Nov. 13, p. 461.

MOORE, JOSIAH J. The Wassermann test in the medical dispensary. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 4, p. 1980.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—OBREGIA and URECHIA. Les variations de l'urée dans le sang, le liquide céphalo-rachidien et l'urine des épileptiques. *L'Encéphale*, 1915, ix.-x., Dec., p. 134.

Neuroses.—FORSYTH, DAVID. Functional nerve disease and the shock of battle. A study of the so-called traumatic neuroses arising in connection with the war. *Lancet*, 1915, clxxxix., Dec. 25, p. 1399.

Psychoneuroses.—CLAUDE, H., and PORAT, R. Les troubles et la motilité dans les psychonévroses du type hystérique. *Prog. Méd.*, 1915, Déc., p. 512.

CLAUDE, H., and PORAK, R. Les troubles de la motilité dans les psychonévroses. Deuxième note: étude ergographiques. *Compt. Rend. d. l. Soc. de Biol.*, 1915, cl., p. 606.

DENY, G. La neuropsychopathologie française pendant une année de guerre (août 1914-août 1915). *L'Encéphale*, 1915, ix.-x., Dec., p. 153.

Psychoses.—NACK, JOSEPH. A review of the study of psychoses associated with cerebral arteriosclerosis. *Med. Record*, 1915, lxxxviii., Dec. 11, p. 1003.

Neuritis.—CLARKE, J. MICHELL. On toxic polyneuritis of the motor type. *Clinical Journ.*, 1915, xliv., Dec. 22, p. 409.

Exophthalmic Goitre, Cretinism, &c.—GEYELIN, H. R. The carbohydrate metabolism in hyperthyroidism as determined by examination of blood and urine. *Archives Int. Med.*, 1915, xvi., Dec. 15, p. 975.

Tetanus.—MACCONKEY, A. T. The prophylaxis of tetanus. *Brit. Med. Journ.*, 1915, Dec. 11, p. 849.

Tetany.—EMSHEIMER, H. W. Tetany in an adult following poisoning from ergot. *N. Y. Med. Journ.*, 1915, cii., Dec. 18, p. 1245.

MISCELLANEOUS SYMPTOMS AND CASES—

CLAUDE, HENRI, and PORAK, RENÉ. Le syndrome des lésions de la queue-de-cheval par projectile de guerre. *L'Encéphale*, 1915, ix.-x., Dec., p. 105 (1 fig.).

WOLFSOHN, J. M. An improved lumbar puncture needle. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2164.

CRILE, GEORGE W. The kinetic drive: its phenomena and its control. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2129.

DONKIN, SIR BRYAN. Responsibility for crime. *Lancet*, 1915, clxxxix., Dec. 18, p. 1346.

PSYCHIATRY.

GENERAL PARALYSIS—

HAMMOND, GRAEME M. The treatment of paresis by injections of neosalvarsan into the lateral ventricle. *Journ. Amer. Med. Assoc.*, 1915, lxv., Dec. 18, p. 2147.

GENERAL—

GREGORY, MENAS S. Transient attacks of manic-depressive insanity. *Med. Record*, 1915, lxxxviii., Dec. 18, p. 1040.

ANTHEAUME, A., and TREPSAT, L. Agitation intermittente à forme maniaque chez un enfant de douze ans. *L'Encéphale*, 1915, ix.-x., Dec., p. 189.

BULLARD, WM. N. Mental disturbances in the feeble-minded. *Journ. Nerv. and Ment. Dis.*, 1915, xlii., Dec., p. 818.

TREATMENT.*

BORDIER, H. The alternating current from the public mains in the treatment of neuritis and muscular atrophy. *Archives of Radiol. and Electrother.*, 1915, xx., Dec., p. 231.

GORDON, ALFRED. Soluble radium salts in organic nervous diseases. *N. Y. Med. Journ.*, 1915, cii., Dec. 18, p. 1225 (1 fig.).

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

ANATOMY.

SYMINGTON, J. Endocranial casts and brain form: a criticism of some recent speculations. *Journ. Anat. and Physiol.*, 1916, l., Jan., p. 111.

STOPFORD, J. S. B. The arteries of the pons and medulla oblongata. *Journ. Anat. and Physiol.*, 1916, l., Jan., p. 131.

BENSLEY, R. R. The normal mode of secretion in the thyroid gland. *Amer. Journ. Anat.*, 1916, xix., Jan., p. 37.

PHYSIOLOGY.

BERITOFF, J. S. On the mode of origination of labyrinthine and cervical tonic reflexes, and on their part in the reflex reactions of the decerebrate preparation. *Quart. Journ. Exp. Physiol.*, 1915, ix., p. 199.

ASAYAMA, CHUAI. The proprioceptive reflex of a flexor muscle. *Quart. Journ. Exp. Physiol.*, 1915, ix., p. 265.

NAGEOTTE, J. Troubles apportés à la croissance des neurites, dans les cicatrices nerveuses, par certaines modifications provoquées de la névroglie. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 679.

NAGEOTTE, J. Action à distance exercée par les macrophages sur le développement des travées névrogliques et sur la myélinisation des neurites dans les cicatrices nerveuses. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 711.

ANDRÉ-THOMAS. La forme de la contraction idio-musculaire dans les lesions des nerfs périphériques. La décontraction lente. Mécano-reaction de dégénérescence. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 49.

ANDRÉ-THOMAS. Syndrome fruste de rotation autour de l'axe longitudinal chez l'homme dans les lésions cérébelleuses. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 53.

SHAMOFF, V. N. On the secretory discharge of the pituitary body produced by stimulation of the superior cervical sympathetic ganglion. *Amer. Journ. of Physiol.*, 1916, xxxix., p. 279.

BARRINGTON, F. J. F. The effect of division of the hypogastric nerves on frequency of micturition. *Quart. Journ. Exp. Physiol.*, 1915, ix., p. 261.

GOMOIU, V. Note sur la résection du sympathique abdominal. *Compt. Rend. Soc. de Med.*, 1916, lxxix., p. 111.

GLEY, E., and MENDELSSOHN, M. Quelques expériences sur le réflexe salivaire conditionnel chez l'homme. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 645.

RABAUD, E. Sur quelques réflexes des Orthoptères acridiens. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 668.

METALNIKOV, S. Le réflexe en tant qu'acte créateur. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 82; Les réflexes chez les protozoaires, *Ibid.*, 1916, lxxix., p. 80.

NETTER, A., KŒCHLIN, J., and SALANIER, M. Réactions méningées consécutives aux injections intrarachidiennes de sérum humain. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 651.

CROZIER, W. J. Ionic antagonism in sensory stimulation. *Amer. Journ. of Physiol.*, 1916, xxxix., p. 297.

LEVENE, P. A., and WEST, C. J. Cephalin. II. Brain cephalin. *Journ. Biol. Chem.*, 1916, xxiv., Jan., p. 41.

LEVENE, P. A. Sphingomyelin, III. *Journ. Biol. Chem.*, 1916, xxiv., Jan., p. 69.

PARDI, UGO. Intorno alle modificazioni istologiche che l'estratto ipofisario induce sulla glandola tiroide. *Lo Sperimentale*, 1916, lxix., p. 843.

PSYCHOLOGY.

CURTIS, J. NASH. Duration and the temporal judgment. *Amer. Journ. Psychol.*, 1916, xxvii., Jan., p. 1.

WELLS, F. L. On the psychomotor mechanisms of typewriting. *Amer. Journ. Psychol.*, 1916, xxvii., Jan., p. 47.

SWIFT, WALTER B. Some developmental psychology in lower animals and in man, and its contribution to certain theories of adult mental tests. *Amer. Journ. Psychol.*, 1916, xxvii., Jan., p. 71.

BURTT, H. E. Factors which influence the arousal of the primary visual memory image. *Amer. Journ. Psychol.*, 1916, xxvii., Jan. p. 87.

DOOLEY, LUCILE. A study in correlation of normal complexes by means of the association method. *Amer. Journ. Psychol.*, 1916, xxvii., Jan., p. 119.

PARKER, G. M. The incest epic of the Freudians. *Med. Record*, 1916, lxxxix., Jan. 1, p. 14.

GREENLEES, T. DUNCAN. The War—Impressions: Neuro- and Psychological. *Caledonian Med. Journ.*, 1916, x., Jan., p. 183.

CLINICAL NEUROLOGY.

GENERAL—

BATTEN, F. E. Some functional nervous affections produced by the war. *Quart. Journ. Med.*, 1916, ix., Jan., p. 73.

NERVES—

HUNT, J. RAMSAY. Tardy or late paralysis of the ulnar nerve; a form of chronic progressive neuritis developing many years after fracture-dislocation of the elbow joint. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 1, p. 11.

CAMPBELL, HARRY. War injuries of the peripheral nerves. *Practitioner*, 1916, xcvi., Jan., p. 62 (illust.).

SPINAL CORD—

General.—CLAUDE, H., and LHERMITTE, J. Etude clinique et anatomo-pathologique de la commotion médullaire directe par projectiles de guerre. *Annales de Méd.*, 1915, No. 5.

Herpes Zoster.—WEINSTEIN, J. A case of herpes zoster presenting multiple symptoms, and at one stage simulating mastoiditis. *Med. Record*, 1916, lxxxix., Jan. 29, p. 194.

TROTTER, WILFRED. Recurrent herpes zoster of the face with hemiatrophy. *Proc. Roy. Soc. Med.*, 1916, ix., Jan. (Dermatol. Sect.), p. 43.

CAMESCASSE. A propos du zona. *Bull. gén. de Thérap.*, 1915, Dec., p. 636.

Hæmatomyelia.—BROOKS, HARLOW. Four cases of hæmatomyelia, with a brief discussion of the etiology. *Amer. Journ. Med. Sci.*, 1916, cli., Jan., p. 100.

Tumour.—CAUSSADE, G., BARRÉ, A., and JOLTRAIN, E. Compression médullaire par tumeur. Etude anatomo-clinique. Remarques. *Annales. de Méd.*, 1915, No. 5.

Poliomyelitis Anterior Acuta.—TAYLOR, R. T. Infantile Paralysis. *N. Y. Med. Journ.*, 1916, ciii., Jan. 29, p. 193 (11 illust.).

BRAIN—

Skull Injury, &c.—ANDERSON, H. M. Case of shrapnel injury to right parietal cortex, showing paresis of left lower extremity, together with cortical sensory loss and thalamic over-response. *Lancet*, 1916, i., Jan. 8, p. 79 (illust.).

LEE, JOHN ROBERT. A case of gunshot wound of the head, with a piece of shrapnel in the brain; value of the use of an electro-magnet and X-ray screen for removal. *Journ. Roy. Army Med. Corps.*, 1916, xxvi., Jan., p. 105.

NUTHALL, A. W. Gunshot wound of the superior longitudinal sinus. A report of three cases. *Brit. Med. Journ.*, 1916, Jan. 1, p. 12.

Meningitis.—WILLIAMS, E. C. Observations on eleven cases of cerebro-spinal fever. *Brit. Journ. Child. Dis.*, 1916, xiii., Jan., p. 8.

OSLER, SIR WM., ROBB, A. G., ROLLESTON, H. D., FOSTER, M. G., and GASKELL, J. F. Treatment of cerebro-spinal meningitis. *Practitioner*, 1916, xcvi., Jan., p. 1.

SUTHERLAND, H. The causes and prevention of epidemic cerebro-spinal meningitis. *Practitioner*, 1916, xcvi., Jan., p. 19.

NEAVE, S. Cerebro-spinal fever. *Practitioner*, 1916, xcvi., Jan., p. 31.

CHARTIER. Traitement de la méningite cérébro-spinale par la ponction dorsale. *Rev. de Med.*, 1914-1915, xxxiv., p. 585.

WEAKLEY, A. L. Metastatic endophthalmitis in a case of cerebro-spinal meningitis. *Brit. Med. Journ.*, 1916, Jan. 8, p. 47.

NETTER, ARNOLD. The cure of suppurative meningococcal iridochoroiditis by injections of anti-meningococcal serum into the vitreous. *Brit. Journ. Child. Dis.*, 1916, xiii., Jan., p. 13.

ELLIS, A. W. M. A classification of meningococci based on group agglutination obtained with monovalent immune rabbit sera. *Journ. Roy. Army Med. Corps.* 1916, xxvi., Jan., p. 64.

COLEBROOK, L., and TANNER, H. M. Meningococcus carriers. *Journ. Roy. Army Med. Corps*, 1916, xxvi., Jan., p. 76.

VINES, H. W. C. A starch medium for the identification of the meningococcus by its sugar reactions. *Journ. Roy. Army Med. Corps*, 1916, xxvi., Jan., p. 89.

HORT, EDWARD C. Epidemic cerebro-spinal fever; the place of the meningococcus in its etiology. *Brit. Med. Journ.*, 1916, Jan. 29, p. 156.

SCHWARTZ, A. B. The etiology of pachymeningitis hemorrhagica interna in infants. *Amer. Journ. Dis. of Child.*, 1916, xi., Jan., p. 23.

MOORHEAD, T. GILLMAN. Meningitis serosa. *Dublin Journ. Med. Sci.*, 1916, Series III., No. 529, p. 1.

MOODY, D. W. K. The diagnosis of so-called primary tuberculous meningitis. Retention of urine in the adult male, without any apparent cause, as a new pathognomonic sign. *Lancet*, 1916, i., Jan. 1., p. 23.

Hydrocephalus.—HUNT, E. LIVINGSTON. Unilateral hydrocephalus. *Med. Record*, 1916, lxxxix., Jan. 8, p. 60.

Disseminated Sclerosis.—BRUCE, A. NINIAN. A case of disseminated sclerosis following exposure, with unusually long period of remission. *Review of Neurol. and Psychiat.*, 1916, xiv., Jan., p. 1.

Progressive Lenticular Degeneration.—SPILLER, WM. G. The family form of pseudo-sclerosis and other conditions attributed to the lenticular nucleus. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 23.

Cerebellar Ataxia. GRIFFITH, J. P. CROZIER. Acute cerebellar ataxia in children: report of a case, with rapid and complete recovery. *Amer. Journ. Med. Sci.*, 1916, cli., Jan., p. 24.

Thrombosis.—MACADAM, WM. Thrombosis of cerebral arteries in the paratyphoid B. *Lancet*, 1916, Jan. 29, p. 243.

Pituitary Tumour.—JOSEFSON, ARNOLD. Distortions of the visual fields in cases of pituitary tumours. *Nord. Med. Arkiv.*, 1916, xlix. (Inre. Med., Afd. II., haft 1), p. 1-5.

Acromegaly.—MARINESCO, G., and MINEA, J. Un cas exceptionnel d'acromégalie. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 99.

Dyspituitarism.—NILES, WALTER L. Dyspituitarism, particularly of the posterior lobe. *Med. Record*, 1916, lxxxix., Jan. 1, p. 6.

Cysticercus.—PEACHELL, G. E. A case of "status epilepticus" and death due to cerebral cysts of *Cysticercus cellulosæ* (larvæ of *Tænia solium*). *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 180.

Pellagra.—M'DONALD, W. M. Notes on pellagra. *Journ. Trop. Med. and Hygiene*, 1916, xix., Jan. 15, p. 17.

Frost-Bite.—SWAN, R. H. J. Trench-foot or so-called "frost-bite." *Practitioner*, 1916, xcvi., Jan., p. 46.

TURRELL, W. J. The electrical treatment of trench-foot and frost-bite. *Practitioner*, 1916, xcvi., Jan., p. 52.

Syphilis.—HAINES, THOMAS H. The incidence of syphilis among juvenile delinquents: its relation to mental status. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 8, p. 102.

LARKIN, JOHN H., and LEVY, I. J. A pathological study of syphilitic aortitis and its serology. *Journ. Exp. Med.*, 1916, xxiii., Jan., p. 25 (Plates 1-7).

M'DONAGH, J. E. R. The rationale of chemotherapy in syphilis, with a description of some new drugs prepared with the knowledge gained therefrom. *Lancet*, 1916, Jan. 29, p. 236.

PAROUNAGIAN, M. B. Problems of syphilitic reinfection. *N. Y. Med. Journ.*, 1916, ciii., Jan. 22, p. 153 (6 illust.).

REYNOLDS, WALTER S. Syphilis inexplicable. *Med. Record*, 1916, lxxxix., Jan. 15, p. 106.

BOGERT, F. v.d. Congenital syphilis, simulating mongolism in one of twins. *Amer. Journ. Dis. of Child.*, 1916, xi., Jan., p. 55.

Salvarsan.—UHLE, A. A., and MACKINNEY, WM. H. Salvarsan in primary syphilis. Five years' experience with 606. *N.Y. Med. Record*, 1916, ciii., Jan. 1, p. 6.

DEXTER, R., and CUMMER, C. L. The intraspinal treatment of syphilis of the central nervous system, according to the method of Swift and Ellis. *Archives of Int. Med.*, 1916, xvii., Jan., p. 82.

DOUGLAS, S. R., and COLEBROOK, L. On the bactericidal power acquired by the serum after the administration of salvarsan or neosalvarsan. *Lancet*, 1916, Jan. 22, p. 181.

Cerebro-Spinal Fluid.—PFEIFFER, J. A. F. A practical method for estimating the protein content of cerebro-spinal fluid. *Med. Record*, 1916, lxxxix., Jan. 8, p. 66.

AYER, JAMES B. Lumbar puncture and examination of the spinal fluid in affections of the eyes. *Archives of Ophthalmol.*, 1916, xlv., Jan., p. 9.

SCHLOSS, O. M., and SCHROEDER, L. C. Nature and quantitative determination of the reducing substance in normal and pathologic cerebro-spinal fluid. *Amer. Journ. Dis. of Child.*, 1916, xi., Jan., p. 1.

SOLOMON, H. C., and WELLES, E. S. The development of the gold sol "paretic" reaction as compared with the "cerebro-spinal syphilitic" type, considered from the time necessary to form a completed reaction. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Jan, 13 and 20, pp. 50 and 81.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—AUER, E. MURRAY. Sensory phenomena in epilepsy. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 439.

GRIFFITH, A. HUME. After-care report of epileptics following colony treatment. *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 151.

Hysteria.—OVERBECK-WRIGHT, A. W. "Possessed by a devil," with its treatment and cure. *Indian Med. Gaz.*, 1916, li., Jan., p. 13.

DE CASTRO, A. BAYLEY. Hysteria (?) in the young African. *Indian Med. Gaz.*, 1916, li., Jan., p. 15.

FRASER, J. S. "Hysterical" mastoiditis. *Edin. Med. Journ.*, 1916, xvi., Jan., p. 37.

MAYLARD, A. B. Hysterical stomachs. *Glasgow Med. Journ.*, 1916, lxxxv., Jan., p. 25.

Alcoholism.—COLLINS, SIR WM. J. The ethics and law of drug and alcohol addiction (Sixth Norman Kerr Lecture). *Brit. Journ. Inebriety*, 1916, xiii., Jan., p. 131.

SIMPSON, JAMES Y. The action of Russia in regard to alcohol. *Brit. Journ. Inebriety*, 1916, xiii., Jan., p. 155.

Neuritis.—MARTIN, WM. Flat foot: its relation to neuritis and its treatment. *Med. Record*, 1916, lxxxix., Jan. 15, p. 101.

Sciatica.—LORTAT-JACOB, SÉZARY, and FERRAND, J. Sciatiques télétrosiques. *Rev. de Méd.*, 1914-1915, xxxiv., p. 579.

Beri-Beri.—WEILL, E., and MOURIQUAND, G. Recherches sur les maladies par "carence." Béribéri expérimental provoqué par une alimentation exclusive par l'orge cortiqué sterilisé. *Compt. Rend. Soc. de Biol.*, 1915, lxxviii., p. 649.

Neuroses.—HARRINGTON, D. W. On the traumatic neuroses. *Med. Press*, 1916, ci., Jan. 26, p. 73.

"Shell-Shock."—MYERS, CHARLES S. Contributions to the study of shell-shock. Being an account of certain cases treated by hypnosis. *Lancet*, 1916, i., Jan. 8, p. 65.

THOMAS, J. LYNN. Peripheral shock and its central effects. *Brit. Med. Journ.*, 1916, Jan. 8, p. 44.

HERTZ, A. F., and ORMOND, A. W. The treatment of "concussion blindness." *Lancet*, 1915, Jan. 1, p. 15.

ORMOND, A. W. The treatment of "concussion blindness." *Journ. Roy. Army Med. Corps*, 1916, xxvi., Jan., p. 43.

PENHALLOW, D. PEARCE. Mutism and deafness due to emotional shock cured by etherisation. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Jan. 27, p. 131.

Exophthalmic Goitre, Cretinism, &c.—CHALIER, ANDRÉ. Graves' disease and sympathicectomy. *Med. Press*, 1916, ci., Jan. 19, p. 57.

DANIELOPOLU, D. Accès de tachycardie paroxystique avec exophtalmie unilatérale chez une ancienne basedowienne. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 103.

SEQUEIRA, J. H. Sclerodermia occurring in a case of myxœdema while under thyroid treatment. *Proc. Roy. Soc. Med.*, 1916, ix., Jan. (Dermatol. Sect.), p. 41.

WHITE, C. PERCIVAL, and HERNAMAN-JOHNSON, F. Hyperthyroidism as a cause of the irritable heart of soldiers. *Lancet*, 1916, i., Jan. 8, p. 78.

Tetany.—SHEILL, SPENCER. Infantile Tetany. *Dublin Journ. Med. Sci.*, 1916, Series III., No. 529, p. 8.

FOWLER, J. S. A case of so-called "tetanism." *Edin. Med. Journ.*, 1916, xvi., Jan., p. 51.

Tetanus.—MOUCHET, ALBERT. Chronic recurrent tetanus. *Med. Press*, 1916, ci., Jan. 12, p. 28.

KILNER, T. P. Report of a case of severe tetanus successfully treated by antitoxin. *Brit. Med. Journ.*, 1916, Jan. 8, p. 46.

MOUAT, T. B. A case of general tetanus following local tetanic spasms of injured limb. *Lancet*, 1916, cxc., Jan. 22, p. 188.

CHAPMAN, C. L. Collapse after anti-tetanic serum injection. *Med. Journ. Australia*, 1916, i., Jan. 8, p. 29.

RENTON, J. C. The value of antitetanic serum. *Brit. Med. Journ.*, 1916, Jan. 15, p. 89.

SPECIAL SENSES AND CRANIAL NERVES—

BROWN, S. H. The facial and trifacial nerves. Remote effects of synchronous palsy of their peripheral branches. *N.Y. Med. Journ.*, 1916, ciii., Jan. 15, p. 106.

FRASER, J. S. Neuritis of cochlear division of the eighth nerve following exposure to cold. *Edin. Med. Journ.*, 1916, xvi., Jan., p. 41.

MISCELLANEOUS SYMPTOMS AND CASES—

WHITE, WM. A. Critical historical review of Reil's rhapsodieen. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 1.

SANCTIS, SANTE DE. Sopra una sindrome della Frenastenia cerebropatica postnatale "Sindrome aparetico-afasica tardiva." *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Gennaio, p. 1.

SCRIPTURE, MAY KIRK, and GLOGAU, OTTO. Speech conflict—a natural consequence in cosmopolitan cities—as an etiological factor in stuttering. A preliminary report based on 200 cases. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Jan., p. 37.

POTTENGER, FRANCIS M. The syndrome of toxæmia: an expression of general nervous discharge through the sympathetic system. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 8, p. 84.

LAIGNEL-LAVASTINE. Sécrétions internes et système nerveux. *Rev. de Méd.*, 1914-1915, xxxiv., p. 602.

LITTLE, S. W. The ductless glands and atypical growth. *N. Y. Med. Journ.*, 1916, ciii., Jan. 29, p. 208.

DANA, CHARLES L. Morbid somnolence and its relation to the endocrine glands. *Med. Record*, 1916, lxxxix., Jan. 1, p. 1.

PSYCHIATRY.

GENERAL PARALYSIS—

COTTON, HENRY A. The treatment of paresis and tabes dorsalis by salvarsanised serum. (Concluded.) *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 485.

SOUTHARD, E. E., and SOLOMON, H. C. Latent neurosyphilis and the question of general paresis—sine paresi. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Jan. 6, p. 8.

FALLS, FRED. H. Proteolytic ferments of the blood serum in tabes dorsalis and general paresis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 1, p. 22.

DARLING, IRA A., and NEWCOMB, PHILIP B. The correlation of clinical and serological findings in paresis and cerebro-spinal syphilis. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 449.

DEMENTIA PRÆCOX—

HAURY. Un dément précoce engagé volontaire. *Rev. de Méd.*, 1914-1915, xxxiv., p. 591.

STEEN, R. H. A characteristic attitude assumed by many cases of dementia præcox. *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 179.

READ, CHARLES F. Treatment of dementia præcox with sodium nucleinate. *Med. Record*, 1916, lxxxix., Jan. 15, p. 104.

GENERAL—

PIERCE, BEDFORD. The absence of proper facilities for the treatment of mental disorders in their early stages. *Brit. Med. Journ.*, 1916, Jan. 8, p. 41.

MERCIER, CHARLES A. On causation. *Journ. Mental Sci.*, 1916, lxii., Jan., p. 1.

THOMSON, D. G. A descriptive record of the conversion of a county asylum into a war hospital for sick and wounded soldiers in 1915. *Journ. Ment. Sci.*, lxii., Jan., p. 109.

VINCENT, WM. Use of asylums as military hospitals. *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 174.

DEVINE, HENRY. The biological significance of delusions. *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 135.

CRUICKSHANK, J., and TISDALL, C. J. The cholesterol content of the serum in mental diseases. *Journ. Ment. Sci.*, 1916, lxii., Jan., p. 168.

STEARNS, A. WARREN. A survey of defective delinquents under the care of the Massachusetts State Board of Insanity. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 427.

FRANZ, SHEPHERD IVORY. The functions of a psychologist in a hospital for the insane. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 457.

KENISTON, JAMES M. Recollections of a psychiatrist. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 465.

WHITE, WM. A. Dangers of the continuous bath. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 481.

SOUTHARD, E. E., and CANAVAN, M. M. Focal lesions of the cortex of the left angular gyrus in two cases of late catatonia. *Amer. Journ. Insanity*, 1916, lxxii., Jan., p. 553.

MYERS, CAMPBELL. Some remarks on mental hygiene and the prevention of insanity. *Med. Press*, 1916, ci., Jan. 12, p. 32.

MASON, B. HENRY. Insanity by contagion. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Jan. 6, p. 5.

SOUTHARD, E. E. Syphilis and the psychopathic hospital. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Jan. 13, p. 51.

WHITING, MADELINE H. On the association of temperature, pulse, and respiration with physique and intelligence in criminals (4 diagrams in text). *Biometrika*, 1915, xi., Nov., p. 1.

ROBINSON, FRANK. The local administration of the Mental Deficiency Act, 1913. *Public Health*, 1916, xxix., Jan., p. 77.

VOIVENEL, PAUL. Littérature actuelle et psychiatrie. A propos du dernier roman de M. Paul Bourget. *Annales Méd.-Psychol.*, 1915, lxxii., Nov.-Déc., p. 529.

SOUCHANOFF, SERGE. De la conviction délirante d'être prisonnier de guerre. Contribution à l'étude des troubles mentaux provoqués par la guerre actuelle. *Annales Méd.-Psychol.*, 1915, lxxii., Nov.-Déc., p. 549.

BINET-SANGLÉ. Un médium à "matérialisations partielles." *Annales Méd.-Psychol.*, 1915, lxxii., Nov.-Déc., p. 558.

DAMAYE, HENRI. Comment on peut actuellement traiter les maladies mentales. *Annales Méd.-Psychol.*, 1915, lxxii., Nov.-Déc., p. 566.

PARANT, VICTOR. Nécessité et légalité de l'interdiction dans les maladies périodiques. *Annales Méd.-Psychol.*, 1915, lxxii., Nov.-Déc., p. 578.

SÉRIEUX, PAUL, and LIBERT, LUCIEN. Le régime des aliénés en France au xviii.e siècle d'après des documents inédits (*suite*). *Annales Méd.-Psychol.*, 1915, lxii., Nov.-Déc., p. 598.

TREATMENT.*

WILLIAMS, TOM A. The management of functional nervous affections. Modern methods illustrated. *Med. Press*, 1916, ci., Jan. 19, p. 50.

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

PHYSIOLOGY.

JEFFERSON, GEOFFREY. Notes on cortical localisation. *Canadian Med. Assoc. Journ.*, 1916, vi., Jan., p. 30.

GREY, ERNEST G. On localisation of function in the canine cerebellum. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Feb., p. 105.

INGEBRIGTSEN, RAGNVALD. A contribution to the biology of peripheral nerves in transplantation.—II. Life of peripheral nerves of mammals in plasma. *Journ. Exp. Med.*, 1916, xxiii., Feb., p. 251.

PATON, D. NOËL, and FINDLAY, LEONARD. Observations on the nerve endings, receptive substance, and contractile substance of muscle. *Journ. Physiol.*, 1916, l., p. 193.

PAUL, J. HERBERT. A comparative study of the reflexes autotomy in decapod crustacea. *Proc. Roy. Soc. Edin.*, 1915, xxxv., p. 232.

AUER, JOHN. The action of the depressor nerve on the pupil. *Proc. Soc. for Exp. Biol. and Med.*, 1915, xiii., Nos. 3, 31 (1095).

PEARL, RAYMOND. Studies on the physiology of reproduction in the domestic fowl. —XIV. The effect of feeding pituitary substance and corpus luteum substance on egg production and growth. *Journ. Biol. Chem.*, 1916, xxiv., Feb., p. 123.

GOETSCH, EMIL. The influence of pituitary feeding upon growth and sexual development. An experimental study (illust.). *Bull. Johns Hopkins Hosp.*, 1916, xxvii., Feb., p. 29.

WATANABE, WALTER K., and CRAWFORD ALBERT C. Does the pituitary gland contain epinephrin or a compound similar to it? *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., Jan., p. 75.

PSYCHOLOGY.

WHITE, WM. A. Symbolism. *Psychoanalytic Review*, 1916, iii., Jan., p. 1.

GREENLEES, T. DUNCAN. The war impressions: neuro- and psychological. *Med. Press*, 1916, cii., Feb. 2, p. 101.

WILLIAMS, TOM A. The craving for the supernatural. *Med. Record*, 1916, lxxxix., Feb. 12, p. 277.

PATHOLOGY.

TAFT, A. E. Extreme calcification in the brain of a subject with mental symptoms. *Review of Neurol. and Psychiat.*, 1916, xiv., Feb., p. 57.

CLINICAL NEUROLOGY.

GENERAL—

MYERSON, A. The value and meaning of the adductor responses of the leg. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Feb., p. 121.

PIERON, HENRI. "Hyperesthésie" signifie toujours "hyperalgésie." *Rev. Neurol.*, 1916, xxii., Nov.-Déc., p. 947.

NERVES—

RANSON, S. WALTER. Unmyelinated nerve-fibres as conductors of protopathic sensation. *Brain*, 1916, xxxviii., p. 381.

CORIAT, ISADOR H. Selective sensory regeneration in an ulnar nerve lesion. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 407.

BILLINGTON, W. Injuries to nerves. *Birmingham Med. Review*, 1916, lxxix., Jan., p. 1.

ROSENTHAL, JOSEPH. Paralysis of the recurrent laryngeal nerve resulting from mitral stenosis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 333.

GUTTMAN, JOHN, and NEUHOF, SELIAN. Radial pulse difference and left recurrent nerve paralysis due to mitral stenosis. *Journ. Amer. Med. Assoc.*, 1916, lxv., Jan. 29, p. 335.

MUSCLES—

LANGELAAN, J. W. On muscle tonus. *Brain*, 1915, xxxviii., p. 235.

SHERRINGTON, C. S. Postural activity of muscle and nerve. *Brain*, 1915, xxxviii., p. 191.

SPINAL CORD—

General.—DUPOUY, ROGER. Le "signe des sternos" symptôme d'irritation bulbo-médullaire. *Rev. Neurol.*, 1915, xxii., Nov.-Déc., p. 951.

Paraplegia.—EDLAVITCH, B. M. Intraspinal injections of mercurialised serum in a case of spastic paraplegia. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 353.

Hereditary Ataxia.—FARNELL, FRED. J. Hereditary spinal ataxia. *Archives of Pediat.*, 1916, xxxiii., Jan., p. 48.

BRAIN—

General.—CRENSHAW, E. H., and REMSEN, C. M. A case of hemiparesis, ataxia, and astereognosis associated with arachnoidal œdema. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 22, p. 262.

Skull Injury, &c.—NUTHALL, A. W. Three cases of gunshot wound of the superior longitudinal sinus. *Journ. Royal Army Med. Corps*, 1916, xxvi., Feb., p. 235.

GRAY, H. M. W. Observations on gunshot wounds of the head. *Brit. Med. Journ.*, 1916, Feb. 19, p. 261.

VILVANDRÉ, GEORGE. Radiography in gunshot wounds of the skull. *Archives of Radiology and Electrotherapy*, 1916, xx., Feb., p. 306.

BESLEY, FRED. A. A contribution to the subject of skull fractures: analysis of 1,000 cases at the Cook County Hospital, and a report of 74 cases examined at necropsy. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 345.

MARIE, PIERRE, and CHATELIN, CHARLES. Les troubles visuels dus aux lésions des voies optiques intracérébrales et de la sphère visuelle corticale dans les blessures du crâne par coup de feu. *Rev. Neurol.*, 1915, xxii., Nov.-Déc., p. 882.

BARNES, FRED. R., and SLOCUM, MORRIS A. Fracture of the skull. *N. Y. Med. Journ.*, 1916, ciii., Feb. 12, p. 309.

Meningitis.—CULPIN, M. The diagnosis of abortive cerebro-spinal meningitis. *Brit. Med. Journ.*, 1916, Feb. 26, p. 307 (with charts).

GAINES, LEWIS M. Epidemic cerebro-spinal meningitis developing twenty-two hours after abdominal operation: report of a case. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 19, p. 558.

HORT, EDWARD C., LAKIN, C. E., and BENIANS, T. H. C. The relationship of the meningococcus of Weichselbaum to the true infective agent in epidemic cerebro-spinal fever. *Journ. Royal Army Med. Corps*, 1916, xxvi., Feb., p. 153.

SHERA, A. GEOFFREY. Broncho-pneumonia with secondary hæmorrhagic meningitis, and recovery. *Brit. Med. Journ.*, 1916, Feb. 5, p. 198.

Hydrocephalus.—FRAZIER, CHAS. H. Types of hydrocephalus—their differentiation and treatment. *Amer. Journ. Dis. of Child.*, 1916, xi., Feb., p. 95.

Thrombosis.—McKENZIE, DAN. Lateral sinus thrombosis followed by tuberculous abscess of the gluteal region simulating pyæmic abscess. *Journ. of Laryngol., Rhinol., and Otol.*, 1916, xxxi., Feb., p. 38.

Hæmorrhage.—LAM, P. W. Case of intracranial hæmorrhage without symptoms of compression. *Lancet*, 1916, Feb. 12, p. 350.

LIPPMAN, MAURICE J. Meningeal hæmorrhage in the new-born. *N. Y. Med. Journ.*, 1916, ciii., Feb. 5, p. 263.

Tumour.—CLIMENKO, H. The diagnosis of brain tumour. *N. Y. Med. Record*, 1916, ciii., Feb. 12, p. 305.

Pituitary Cyst.—CATARINICH, J. Case of pituitary cyst: death from adrenal hæmorrhage. *Med. Journ. Australia*, 1916, i., Jan. 22, p. 73.

Aphasia.—MINGAZZINI, G. Note cliniche ed anatomo-patologiche sopra la sede delle vie verbofasiche e verboartriche. *Riv. di Patol. nerv. e ment.*, 1916, xxi., p. 104.

Pellagra.—GOLDBERGER, JOSEPH. Pellagra: causation and a method of prevention: a summary of some of the recent studies of the United States Public Health Service. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 471.

Beri-Beri.—McWALTER, J. C. Relapsing beri-beri. *Brit. Med. Journ.*, 1916, Feb. 5, p. 200.

Syphilis.—DRAPER, GEORGE. The reactions and results of treatment in cerebro-spinal syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 400.

HUNT, EDWARD L. Intraspinal administration of mercurialised serum in the treatment of syphilis of the nervous system. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 404.

WALKER, I. CHANDLER. Treatment of central nervous system syphilis. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Feb. 10, p. 195.

GILPIN, SHERMAN F., and EARLEY, THOMAS B. Drainage of cerebro-spinal fluid as a factor in the treatment of nervous syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 22, p. 260.

SYMMERS, DOUGLAS, and WALLACE, GUY H. The etiology of syphilitic aortitis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 397.

NOGUCHI, HIDEYO. Certain alterations in biological properties of spirochætes through artificial cultivation (Jubilé E. Metchnikoff). *Annales de l'Institut Pasteur*, 1916, xxx., Jan., p. 1.

Salvarsan.—LINTZ, WM. Apparatus for use in blood transfusions, salvarsan administration, aspiration, &c. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 506.

MARIÈ, P.-L. Accidents sériques chez l'homme, consécutifs à l'injection intra-veineuse de sérum humain. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 149.

Cerebro-Spinal Fluid.—DIXON, W. E., and HALLIBURTON, W. D. The cerebro-spinal fluid.—IV. Circulation. *Journ. Physiol.*, 1916, L., p. 198.

HOFFMANN, W. O., and SCHWARTZ, A. B. The permanganate reduction index of cerebro-spinal fluid. *Archives of Int. Med.*, 1916, xvii., Feb., p. 293.

ELLIOTT, ARTHUR R. Trichinosis: report of a case with trichina larvæ in the spinal fluid. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 504.

CANTI, R. G. The urea content of the cerebro-spinal fluid: with special reference to the diagnosis of uræmia. *Lancet*, 1916, Feb. 12, p. 344.

Wassermann Reaction.—WALKER, I. C., and HALLER, D. A. Routine Wassermann examinations of 4,000 hospital patients. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 488.

HORNER, ALBERT A. The occurrence of the Wassermann reaction among hospital patients. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Feb. 10, p. 194.

MORSE, STERNE. Dry permanent standards in the Wassermann reaction, and a technic based on their use. *Psychiatric Bulletin*, 1916, ix., Jan., p. 47.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—CLARK, L. PIERCE. Clinical studies in epilepsy. *Psychiatric Bulletin*, 1916, ix., Jan., p. 60.

REED, CHARLES A. L. Diagnostic methods and pathologic constants in idiopathic epilepsy. Second report. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Jan. 29, p. 336.

LINDENBERGER, IRVIN. Pituitary extract (anterior lobe) in idiocy and epilepsy (cerebro-spinal meningitis). *Pediatrics*, 1916, xxviii., Jan., p. 4.

Hysteria.—ISMAEL, ABD-EL-AZIZ. Hysterical anæsthesia in Egyptians. *Practitioner*, 1916, xcvi., Feb., p. 221.

Alcoholism.—SCHNEIDER, CARL VON A. Studies on alcoholic hallucinoses. *Psychiatric Bulletin*, 1916, ix., Jan., p. 3.

Neurasthenia.—CRAIG, JAMES. The neurasthenic element in disease. *Glasgow Med. Journ.*, 1916, lxxxv., Feb., p. 87.

"Shell-Shock."—MOTT, FRED. W. The effects of high explosives upon the central nervous system. (Lettsomian lectures.) *Lancet*, 1916, Feb. 12 and 26, pp. 331 and 441 (illust.).

DAWSON, G. DE H. A case of shell concussion; treatment by general anæsthesia. *Lancet*, 1916, Feb. 26, p. 463.

BALLET, GILBERT. Note sur la relation des tremblements et des états émotionnels. Le tremblement envisagé en tant qu'e expression mimique de la frayeur. *Rev. Neurol.*, 1916, xxii., Nov.-Déc., p. 934.

BABINSKI, J., and FROMENT, J. Contribution à l'étude des troubles nerveux d'ordre réflexe. Examen pendant l'anesthésie chloroformique. *Rev. Neurol.*, 1915, xxii., Nov.-Déc., p. 925.

Exophthalmic Goitre, Cretinism, &c.—POOL, EUGENE H., and FALK, HENRY C. Concerning the surgical anatomy of the thyroid, with special reference to the parathyroid glands. *Annals of Surgery*, 1916, lxiii., Jan., p. 71.

DOWD, CHARLES N. Goitre: an analysis of 137 cases. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 12, p. 480.

BASINGER, H. RAYMOND. The control of experimental cretinism. *Archives of Int. Med.*, 1916, xvii., Feb., p. 260.

Tetanus.—PENSHALLOW, D. PEARCE. A case of tetanus occurring in a soldier two months after being wounded. *Lancet*, 1916, Feb. 26, p. 464.

INGLETON, A. T. Aseptic meningitis following intrathecal injection of antitetanic serum. *Journ. Royal Army Med. Corps*, 1915, xxvi., Feb., p. 234.

SPECIAL SENSES AND CRANIAL NERVES—

WHALE, H. LAWSON. Two cases of post-operative intracranial injection of otitic origin. *Journ. of Laryngol., Rhinol., and Otol.*, 1916, xxxi., Feb., p. 33.

MISCELLANEOUS SYMPTOMS AND CASES—

SOUQUES, A., and ROSANOFF-SALOFF, MME. La camptocormie. Incurvation du tronc consécutive aux traumatismes du dos et de slombes. *Rev. Neurol.*, 1915, xxii., Nov.-Déc., p. 937.

MEIGE, HENRY. De certaines boiteries observées chez les "blessés nerveux." Remarques morphologiques et physiologiques. *Rev. Neurol.*, 1916, xxii., Nov.-Déc., p. 939.

CRENSHAW, HANSELL. Tremor tracings. *N.Y. Med. Journ.*, 1916, ciii., Feb. 12, p. 308 (4 charts).

THOMSON, H. CAMPBELL. Recent work on diseases of the nervous system. *Practitioner*, 1916, xcvi., Feb., p. 201.

SCRIPTURE, MAY KIRK, and GLOGAU, OTTO. Speech conflict—a natural consequence in cosmopolitan cities—as an etiological factor in stuttering: a preliminary report based on 200 cases. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., Feb., p. 139.

PSYCHIATRY.

GENERAL PARALYSIS—

WILE, UDO J. Experimental syphilis in the rabbit produced by the brain substance of the living paretic. *Journ. Exp. Med.*, 1916, xxiii., p. 199.

GENERAL—

BUSCAINO, V. M., and COPPOLA, A. Disturbi mentali in tempo di guerra. *Riv. di Patol. nerv. e ment.*, 1916, xxi., p. 1.

BALFOUR, DONALD C. Foreign bodies swallowed by an insane woman. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 5, p. 421.

VIDONI, GIUSEPPE. La vaccinazione antitifica negli ammalati di mente. *Rassegna di Studi Psichiat.*, 1915, v., Nov.-Déc., p. 389.

PERKINS, ANNE E. The relation of pelvic diseases to mental disorders. *Psychiatric Bulletin*, 1916, ix., Jan., p. 26.

MABON, WM. The present standard of the care and treatment in State hospitals. *Albany Med. Annals*, 1916, xxxvii., Feb., p. 66.

KARPAS, MORRIS J. Criminology from the standpoint of a psychiatrist. *N. Y. Med. Journ.*, 1916, ciii., Feb. 5, p. 246.

BARR, MARTIN W. The prevention of feeble-mindedness. *Albany Med. Annals*, 1916, xxxvii., Feb., p. 58.

WINTER, W. A. Physically defective children and the problem of their education. *Med. Press*, 1916, cii., Feb. 9, p. 121.

WILDMAN, H. VALENTINE. Mental defectives: their importance. *Med. Press*, 1916, cii., Feb. 16, p. 148.

IVES, A. W. Diagnostic phenomena of infantile weak-mindedness, namely, imbecility, dementia, and idiocy. *Pediatrics*, 1916, xxviii., Feb., p. 67.

TREATMENT.*

Psychoanalysis—JELLIFFE, SMITH ELY. Technique of Psychoanalysis (contd.). *Psychoanalytic Review*, 1916, iii., Jan., p. 26.

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

ANATOMY.

JENKINS, GEORGE B. A study of the morphology of the inferior olive. *Anat. Record*, 1916, x., Feb., p. 317 (6 figs.).

CROZIER, W. J. Regarding the existence of the "common chemical sense" in vertebrates. *Journ. Comp. Neurol.*, 1916, xxvi., Feb., p. 1.

ALLEN, WM. F. Studies on the spinal cord and medulla of cyclostomes, with special reference to the formation and expansion of the roof plate and the flattening of the spinal cord. *Journ. Comp. Neurol.*, 1916, xxvi., Feb., p. 9 (87 figs.).

BAILEY, PERCIVAL. Morphology of the roof plate of the forebrain and the latera. choroid plexuses in the human embryo. *Journ. Comp. Neurol.*, 1916, xxvi., Feb. p. 79 (31 figs.).

JACKSON, C. M. Effects of inanition upon the structure of the thyroid and para thyroid glands of the albino rat. *Amer. Journ. Anat.*, 1916, xix., March, p. 305 (14 figs.).

PHYSIOLOGY.

ROBERTSON, T. BRAILSFORD. Experimental studies on growth. I. Methods II. The normal growth of the white mouse. III. The influence of the anterior lobe of the pituitary body upon the growth of the white mouse. IV. The influence of tethelin, the growth-controlling principle of the anterior lobe of the pituitary body, upon the growth of the white mouse. On the isolation and properties of tethelin, the growth-controlling principle of the anterior lobe of the pituitary body. *Journ. Biol. Chem.*, 1916, xxiv., March, pp. 347-421.

FULK, M. E., and MACLEOD, J. J. R. Evidence that the active principle of the retroperitoneal chromaphil tissue has the same physiological action as the active principle of the suprarenal glands. *Amer. Journ. Physiol.*, 1916, xl., p. 21.

LEWIS, J. H. The presence of epinephrin in human fœtal adrenals. *Journ. Biol. Chem.*, 1916, xxiv., March, p. 249.

HOOKINS, R. G. Action of pituitary extract. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 4, p. 733.

PSYCHOLOGY.

LECLÈRE, A. La psychologie des grafitti. *Arch. de Psychol.*, 1916, xv., p. 321.

DELACROIX, H. Remarques sur "une mystique moderne." *Arch. de Psychol.*, 1915, xv., p. 338.

MOLNAR, E. Une nouvelle méthode en psychologie religieuse. *Arch. de Psychol.*, 1915, xv., p. 354.

KENNEL, P. Essai de classification des odeurs par la methode des majorités. *Arch. de Psychol.*, 1915, xv., p. 375.

SCHULTZ, EUG. Sur l'application de la psychologie expérimentale à l'analyse de la morphogenèse. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 205.

BURR, CHARLES W. The psychology of the physician as a wage-earner. *N. Y. Med. Journ.*, 1916, ciii., March 2, p. 481.

PATHOLOGY.

ARETINI, ASCANIO. Sulla istopatologia generale della nevroglia fibrillare nella corteccia del cervelletto. *Rassegna di Studi Psichiat.*, 1916, vi., Gennaio-Febbraio, p. 3.

BROWN, GLADYS M. The rapid demonstration of Negri bodies. *Indian Journ. Med. Research*, 1916, iii., Jan., p. 558 (1 plate).

PAPADIA, G. Su alcune formazioni ialoidi del sistema nervoso centrale. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Marzo, p. 129.

CLINICAL NEUROLOGY.

GENERAL—

JELLIFFE, SMITH ELY, and WHITE, WM. A. Principles underlying the classification of diseases of the nervous system. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 11, p. 781.

SALMON, ALBERT. D'un intéressant phénomène d'automatisme qu'on remarque après les efforts musculaires chez les sujets sains. *Rev. Neurol.*, 1916, xxiii., Jan., p. 27 (2 figs.).

JARKOWSKI, J. Quelques remarques sur les réflexes de défense dits "d'automatisme médullaire." *Rev. Neurol.*, 1916, xxiii., Jan., p. 34.

SOBRINHO, FONSECA. Contribution à l'étude du réflexe achilléen. *Rev. Neurol.*, 1916, xxiii., Jan., p. 38.

NERVES—

SHARPE, WM. The operative treatment of brachial plexus paralysis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 876.

CAVAZZANI, EMILIO. Di un segno che accompagna le lesioni traumatiche dei nervi periferici (anestesia anisotopica tattotermica). *Riv. di Patol. nerv. e ment.*, 1916, xxi., Marzo, p. 182.

MUSCLES—

THOMSON, JOHN. A case of myotonia congenita (Thomsen's disease) in a child. *Edin. Med. Journ.*, 1916, xvi., March, p. 216 (7 figs.).

SPINAL CORD—

General.—GROSSMANN, JACOB. Spastic paralysis in children. *N.Y. Med. Journ.*, 1916, ciii., March 11, p. 495 (5 illust.).

Herpes Zoster.—WEBER, F. PARKES. Two cases of herpes zoster associated with a generalised eruption of varicella-like spots: one of the cases followed by oculomotor paresis, mydriasis, and frontal anæsthesia. *Brit. Journ. Dermatol.*, 1916, xxviii., Jan.-March, p. 13.

Spina Bifida.—CATES, B. B. Spina bifida. *Boston Med. and Surg. Journ.*, 1916, clxxiv., March 23, p. 420.

Tabes.—STARKEY, FRANK R. A broader view of tabes dorsalis. *Med. Record*, 1916, lxxxix., March 4, p. 415.

SPILLER, WM. G. Tabetic ocular crises. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 855.

Poliomyelitis Anterior Acuta.—LOVETT, R. W., and MARTIN, E. G. Certain aspects of infantile paralysis, with a description of a method of muscle testing. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 4, p. 729.

BRAIN—

General.—SKINNER, E. H. Intracranial ærocele. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 25, p. 954.

Skull, Injury, &c.—SCHWARTZ, ANSELME, and MOCQUOT. The immediate treatment of head injuries from projectiles. *Practitioner*, 1916, xcvi., March, p. 278.

VILVANDRÉ, GEO. Radiography in gunshot wounds of the skull. *Journ. Royal Army Med. Corps*, 1916, xxvi., March, p. 391.

LEE, JOHN ROBERT. Removal of intracranial foreign body under X-rays. *Brit. Med. Journ.*, 1916, March 25, p. 447.

Meningitis.—DREW, AUBREY H. The meningococcus in epidemic cerebro-spinal meningitis. *Journ. State Med.*, 1916, xxiv., p. 122.

SCOTT, H. H. A case of hyperacute cerebro-spinal meningitis with absence of cerebral symptoms: meningococcus isolated from the blood. *Journ. Roy. Army Med. Corps*, 1916, xxvi., March, p. 394.

SANDWITH, F. M. A Gresham lecture on cerebro-spinal meningitis. *Clin. Journ.*, 1916, xlv., March 1 and 8, pp. 77 and 90.

NEALE, JOSEPHINE B. Treatment of cases of epidemic meningitis, illustrating the importance of frequent repetition of the injection. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 862.

BULL, R. J., and FAIRLEY, N. H. Complement reinforcement of anti-meningococcal serum in the treatment of cerebro-spinal meningitis. *Med. Journ. Australia*, 1916, i., Feb. 5, p. 114.

AMOSS, HAROLD L., and WOLLSTEIN, MARTHA. A method for the rapid preparation of antimeningitis serum. *Journ. Exp. Med.*, 1916, xxiii., p. 403.

MORGAN, EDWARD A. A study of the blood in tuberculous meningitis. *Amer. Journ. Dis. Child.*, 1916, xi., March, p. 224.

Thrombosis.—REYNOLDS, C. E. Sinus thrombosis in compression. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 25, p. 952.

Hæmorrhage.—GORDON, ALFRED. Ventricular hæmorrhage: a symptom-group. *Archives Int. Med.*, 1916, xvii., March, p. 343.

Hemiplegia.—MARIE, PIERRE, and FOIX, CH. Les syncinésies des hémiplégiques. Etudes séméiologique et classification. *Rev. Neurol.*, 1916, xxiii., Jan., p. 3.

Tumour.—CHRISTIE, W. LEDINGHAM. Cranial tumour (? dermoid by implantation). *Brit. Med. Journ.*, 1916, March 18, p. 416.

Pituitary Tumour.—COPE, V. ZACHARY. Hunterian lecture on the pituitary fossa and the surgical methods of approach to it. *Lancet*, 1916, cxc., March 18, p. 601 (illust.).

Dyspituitarism.—STEPHENSON, SYDNEY. Dyspituitarism in a girl aged 15 years. *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Sect. Study Dis. of Child.), p. 23.

Cerebro-Cerebellar Ataxia.—GORDON, ALFRED. Cerebro-cerebellar ataxia. *N. Y. Med. Journ.*, 1916, ciii., March 4, p. 440.

Aphasia, Apraxia, &c.—SMITH, S., and HOLMES, GORDON. A case of bilateral motor apraxia with disturbance of visual orientation. *Brit. Med. Journ.*, 1916, March 25, p. 437.

Pellagra.—NESBITT, CHARLES T. Sanitation and the control of pellagra. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 647.

HOLMES, WM. H. Remarks on *B. Welchii* in the stools of pellagrins. *Archives of Int. Med.*, 1916, xvii., March, p. 453.

Lead Poisoning.—WIDAL. Plumbism and Bright's disease. *Med. Press*, 1916, *n.s.* ci., March 22, p. 260.

Syphilis.—COLLINS, JOSEPH. Unsuspected syphilis in neurology. *N. Y. Med. Journ.*, 1916, ciii., Feb. 26, p. 389.

WHOLEY, C. C. Complicated nerve tissue involvement arising from syphilis of the vertebræ. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 627.

VEEDER, BORDEN S., and JEANS, PHILIP C. Observations on 100 cases of the infantile type of hereditary syphilis. *Amer. Journ. Dis. Child.*, 1916, xi., March, p. 177.

BARKER, LEWELLYS F. Syphilis and internal medicine. *N. Y. Med. Journ.*, 1916, ciii., Feb. 26, p. 385.

BEST, WM. H. Intramuscular injections of mercury salicylate in the treatment of syphilis. *Med. Record*, 1916, lxxxix., March 11, p. 473.

GALWEY, W. R., and MARCHANT, C. H. Noguchi's serum test for syphilis. *Indian Med. Gaz.*, 1916, li., March, p. 87.

ZINSSER, HANS, and HOPKINS, J. G. Studies on *Treponema pallidum* and syphilis.—II. Spirochæticidal antibodies against *Treponema pallidum*. *Journ. Exp. Med.*, 1916, xxiii., p. 323.

ZINSSER, HANS, HOPKINS, J. G., and M'BURNEY, MALCOLM. Studies on *Treponema pallidum* and syphilis.—III. The individual fluctuations in virulence and comparative virulence of *Treponema pallidum* strains passed through rabbits. *Journ. Exp. Med.*, 1916, xxiii., p. 329.

ZINSSER, HANS, HOPKINS, J. G., and M'BURNEY, MALCOLM. Studies on *Treponema pallidum* and syphilis.—IV. The difference in behaviour in immune serum between cultivated non-virulent *Treponema pallidum* and virulent treponemata from lesions. *Journ. Exp. Med.*, 1916, xxiii., p. 341.

Salvarsan.—ORMSBY, O. S., and MITCHELL, J. H. Arsenobenzol in the treatment of syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 867.

M'DONALD, W. M. Technique of intramuscular injection of salvarsan. *Journ. Trop. Med. and Hygiene*, 1916, xix., p. 68.

COOK, ABNER H. Alarming symptoms caused by diarsenol. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 865.

Wassermann Reaction.—HALLER, DAVID A. Variations in the strength of positive Wassermann reactions in cases of untreated syphilis, with remarks on the variations which follow the use of mercury. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 882.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—CLARK, L. PIERCE. Some therapeutic suggestions derived from the newer psychological studies upon the nature of essential epilepsy. *Med. Record*, 1916, lxxxix., March 4, p. 403.

Hysteria.—BURROW, TRIGANT. The philology of hysteria: an *a priori* study of the neuroses in the light of Freudian psychology. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 11, p. 783.

Alcoholism.—HIRSCH, EDWIN F. The gastric mucosa in delirium tremens. *Archives Int. Med.*, 1916, xvii., March, p. 354.

Migraine.—HUNT, J. RAMSAY. Recurrent paralysis of the facial nerve and its relation to the so-called facioplegic migraine. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 885.

Neuritis.—EDWARDS, C. R. Peripheral neuritis in Jamaica. Is it beri-beri? Is it a food disease? *Journ. Trop. Med. and Hygiene*, 1916, xix., March 1, p. 73.

Neurasthenia.—GREGG, DONALD. Physiological considerations in the differential diagnosis of neurasthenia, hysterical and psychotic symptoms. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Feb. 24, p. 275.

Psychoneuroses.—M'KENZIE, B. E. The psychoneuroses. *Canadian Med. Assoc. Journ.*, 1916, vi., Feb., p. 118.

"Shell-Shock."—Special discussion on shell-shock without visible signs of injury. Opened by Major F. W. Mott. *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Sect. of Psychiat. and Neurol.), p. 1.

MYERS, CHARLES S. Contributions to the study of shell-shock. Being an account of certain disorders of cutaneous sensibility (III.). *Lancet*, 1916, cxc., March 18, p. 608.

MOTT, FRED. W. The Lettsomian Lectures on the effects of high explosives upon the central nervous system (III.). *Lancet*, 1916, cxc., March 11, p. 553.

ROWS, R. G. Mental conditions following strain and nerve shock. *Brit. Med. Journ.*, 1916, March 25, p. 441.

GOSSET, H. Traitement des impotences consécutives aux blessures de guerre par la rééducation psycho-motrice. *Prog. Med.*, 1916, Mars 5, p. 35.

BUSCAINO, V. M., and COPPOLA, A. Disturbi mentali in tempo di guerra. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Marzo, p. 135.

Raynaud's Disease.—WEEKS, DAVID F., and RENNER, DAN S. A case of symmetrical gangrene or Raynaud's disease associated with epilepsy. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 651.

Exophthalmic Goitre, Cretinism, &c.—SEQUEIRA, J. H. Sclerodermia with Graves' disease. *Proc. Roy. Soc. Med.*, 1916, lx., Feb. (Dermatol. Sect.), p. 66.

SEQUEIRA, J. H. Four cases of sclerodermia associated with disease of the thyroid gland. *Brit. Journ. Dermatol.*, 1916, xxviii., Jan.-March, p. 31.

LAHEY, FRANK H. What goitre demand operation? *Boston Med. and Surg. Journ.*, 1916, clxxiv., Feb. 24, p. 273.

KENDALL, E. C. The function of the thyroid-parathyroid apparatus. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 11, p. 811.

TROELL, ABRAHAM. Some attempts to produce exophthalmos experimentally. *Archives Int. Med.*, 1916, xvii., March, p. 382.

Tetanus.—MACCONKEY, A. T. A plea for a collective study of tetanus. *Journ. Royal Army Med. Corps*, 1916, xxvi., March, p. 291.

GAUMER, J. S. Report of a case of tetanus, with complications. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 4, p. 739.

EVERIDGE, JOHN. Mental symptoms complicating a case of acute tetanus during treatment by carbolic injections. *Brit. Med. Journ.*, 1916, March 25, p. 443.

MACCONKEY, A. T. Iodine in tetanus. *Brit. Med. Journ.*, 1916, March 18, p. 411.

MÉRIEUX. De l'action sur les plaies tétaniques du serum anti-tétanique desséché, additionné de sous-gallate de bismuth. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 199.

MELTZER, S. J. Inhibitory properties of magnesium sulphate and their therapeutic application in tetanus. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 25, p. 931.

SPECIAL SENSES AND CRANIAL NERVES—

WALTER, WILL. Clinical pathology of ocular muscle paralysis: a critique of the more recent literature on ocular movements, with special reference to the study of the control of the ocular muscles. *Archives of Ophthalmol.*, 1916, xlv., p. 172.

VERHOEFF, F. H. Rosacea keratitis and certain other forms of marginal keratitis, neuropathic in origin. Treatment by pericorneal neurotomy. *Archives of Ophthalmol.*, 1916, xlv., p. 148.

TAYLOR, JAMES. The Harveian Lecture on nervous and other medical disorders as seen at an eye hospital. *Lancet*, 1916, March 25, p. 657 (illustr.).

MISCELLANEOUS SYMPTOMS AND CASES—

GORDON, ALFRED. Overactivity as a potent factor in the etiology of some nervous diseases; inquiry of 187 cases. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 641.

SANCTIS, SANTE DE. Sopra una sindrome della Frenastenia cerebropatica postnatale "Sindrome aparetico-afasica tardiva." *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Feb., p. 49.

STERN, A. Neurotic manifestations in children. *Med. Record*, 1916, lxxxix., Feb. 26, p. 361.

CUTLER, E. C. Neurological surgery in a war hospital. *Boston Med. and Surg. Journ.*, 1916, clxxiv., March 2, p. 305.

SCELETH, CHARLES E. A rational treatment of the morphin habit. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 860.

FRIEDMAN, HENRY M. Constitutional inferiority. Survey. *Med. Record*, 1916, lxxxix., Feb. 19, p. 313.

GOODALE, J. L. Skin reactions by various bacterial proteids in certain vasomotor disturbances of the upper air passages. *Boston Med. and Surg. Journ.*, 1916, clxxiv., Feb. 17, p. 223.

PSYCHIATRY.

GENERAL PARALYSIS—

COLLINS, JOSEPH. The recognition of general paresis while it is still susceptible to treatment, with remarks on the course and clinical features of the disease. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 18, p. 851.

WILE, UDO J., and KRUIF, PAUL HENRY DE. Cultural experiments with the *Spirocharta pallida* derived from the paretic brain. *Journ. Amer. Med. Assoc.*, 1916, lxvi., Feb. 26, p. 646.

DEMENTIA PRÆCOX—

MARSHALL, J. A. The salivary factor and its relation to dental caries and immunity in dementia præcox and epilepsy. *Amer. Journ. Physiol.*, 1916, xl., p. 1.

GENERAL—

BALLET, GILBERT. La psychose hallucinatoire chronique. *Rev. Neurol.*, 1916, xxiii., Jan., p. 41.

COURTNEY, J. W. Concerning the *raison d'être* of the term "involution" as applied to melancholia. *Boston Med. and Surg. Journ.*, 1916, clxxiv., March 23, p. 416.

MERCIER, CHAS. Diet as a factor in the causation of mental disease. *Lancet*, 1916, cxc., March 11, p. 561 (concluded).

GRECO, FRANCESCO DE. Sul "carettere" degli omicidi che premeditano. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Feb., p. 63.

PATON, STEWART. The city's need of a psychopathic clinic. *Journ. Amer. Med. Assoc.*, 1916, lxvi., March 11, p. 808.

ROBERTSON, GEORGE M. The employment of female nurses in the male wards of mental hospitals in Scotland. *Edin. Med. Journ.*, 1916, xvi., March, p. 193.

TREATMENT.*

LEWIS, PERCY. Treatment of nervous disorders. *Med. Press*, 1916, cii., March 1, p. 187.

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

ANATOMY.

STOPFORD, J. S. B. The arteries of the pons and medulla oblongata.—II. *Journ. Anat. and Physiol.*, 1916, l., xi., April, p. 255.

BURR, H. SAXTON. Regeneration in the brain of Amblystoma.—I. The forebrain. *Journ. Comp. Neurol.*, 1916, xxvi., p. 203.

AREY, L. B. The movements in the visual cells and retinal pigment of the lower vertebrates. *Journ. Comp. Neurol.*, 1916, xxvi., p. 121.

NAGEOTTE, J. Note sur les fibres à myéline et sur les étranglements de Ranvier chez certains Crustacés. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 259.

PHYSIOLOGY.

BARENNE, DUSSER DE. Experimental researches on sensory localisations in the cerebral cortex. *Quart. Journ. Exp. Med.*, 1916, ix., p. 355.

TSUKAGUCHI, R. On the regeneration of the cervical sympathetic after section. *Quart. Journ. Exp. Physiol.*, 1916, ix., p. 281.

SCHÄFER, E. A., and FEISS, H. O. Notes on the functional regeneration of the cut cervical sympathetic and vagus. *Quart. Journ. Exp. Physiol.*, 1916, ix., p. 329.

NAGEOTTE, J. Substance collagène et névroglie dans le cicatrisation des nerfs. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 322.

MARTIN, E. G., and STILES, P. G. Vasomotor summations. *Amer. Journ. Physiol.*, 1916, xl., p. 194.

BEIFELD, A. F., WHEELON, HOMER, and LOVELETTE, C. R. The influence of hypotensive gland extracts on vasomotor irritability. *Amer. Journ. Physiol.*, 1916, xl., p. 360.

M'GUIGAN, HUGH, KEETON, R. W., and SLOAN, L. H. The segmental action of strychnine. *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., March, p. 143.

MOMOSE, G. On the inositol of brain and its preparation. *Biochem. Journ.*, 1916, x., March, p. 120.

ROSENHEIM, O. The galactosides of the brain.—IV. The constitution of phrenosin and kerasin. *Biochem. Journ.*, 1916, x., March, p. 142.

LIVINGSTON, A. E. The effect of castration on the weight of the pituitary body and other glands of internal secretion in the rabbit. *Amer. Journ. Physiol.*, 1916, xl., p. 153.

ROBERTSON, T. BRAILSFORD. The effects of tethelin acceleration in the recovery of weight lost during inanition and in the healing of wounds. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 1, p. 1009.

HOSKINS, R. G., and HOSKINS, A. D. The effects of suprarenal feeding. *Archives Int. Med.*, 1916, xvii., April, p. 584.

LEWIS, R. W., and PAPPENHEIMER, A. M. A study of the involutional changes which occur in the adrenal cortex during infancy. *Journ. Med. Research*, 1916, xxxiv., March, p. 81 (2 plates).

BEDFORD, E. A., and JACKSON, H. C. The epinephric content of the blood in conditions of low blood pressure and "shock." *Proc. Soc. for Exp. Biol. and Med.*, 1916, xiii., 50 (1114).

PSYCHOLOGY.

CHAPIN, J. B. The mechanism of a dream. *Albany Med. Annals*, 1916, xxxvii., April, p. 151.

FOSTER, W. S., and ROESE, K. The tridimensional theory of feeling from the standpoint of typical experiences. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 157.

TODD, A. J. Primitive notions of the "self." *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 171.

ARPS, G. F. A marked case of double inversion. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 203.

BLISS, S. H. The significance of clothes. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 217.

MOORE, H. T. A method of testing the strength of instincts. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 227.

BRADFORD, E. J. G. Measures of variability. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 234.

ABBOT, E. S. The casual relations between structure and function in biology. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 245.

LUCKIESH, M. A note on colour preference. *Amer. Journ. Psychol.*, 1916, xxvii., p. 251.

CHAPMAN, J. C., and NOLAN, W. J. Initial spurt in a simple mental function. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 256.

FERNBERGER, S. W. The effects of practice in its initial stages in lifted weight experiments and its bearing upon anthropometric measurements. *Amer. Journ. Psychol.*, 1916, xxvii., April, p. 261.

PATHOLOGY.

ARETINI, ASCANIO. Alcune osservazioni sul potere di reazione dei prolungamenti protoplasmatici delle cellule del Purkinje. *Rassegna di Studi Psichiat.*, 1916, vi., p. 85.

BRAMWELL, BYROM, BOLTON, JOSEPH SHAW, and ROBINSON, WILLIAM. Bilateral lesion of the occipital lobes with retention of macular as distinct from panoramic vision. *Brain*, 1915, xxxviii., p. 447.

RIQUIER, G. C. Lo sviluppo del sistema nervoso simpatico nei cheloni e negli uccelli. *Riv. di Patol. nerv. e ment.*, 1916, Aprile, p. 193.

D'ABUNDO, G. Alterazioni nel sistema nervoso centrale consecutive a particolari commozioni traumatiche. *Riv. Ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Aprile, p. 145.

GRECO, FR. DEL. Uno sguardo sulla Psicopatologia morale. *Riv. Ital. de Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Aprile, p. 172.

CLINICAL NEUROLOGY.

GENERAL—

TAYLOR, JAMES. The ophthalmological observations of Hughlings Jackson and their bearing on nervous and other diseases. *Proc. Roy. Soc. Med.*, 1915, ix., Nov. (Neurol. Sect.), p. 1; *Brain*, 1915, xxxviii., p. 391.

CARLILL, HILDRED B. The diagnostic importance of the ankle-jerk. *Journ. Roy. Naval Med. Serv.*, 1916, ii., April, p. 180.

PAULIAN, D.-EM. Sur le phénomène de la face et le signe contralatéral de la face. *Rev. Neurol.*, 1916, xxiii., Fév., p. 209.

NERVES—

STOPFORD, J. S. B. Gunshot injuries of the peripheral nerves: the syndrome of compression. *Lancet*, 1916, cxc., April 1, p. 718 (illustr.).

CORE, DONALD E. The dissociation of cutaneous sensations in injuries to peripheral nerves. *Lancet*, 1916, cxc., April 1, p. 716 (illustr.).

ROTH, P. B. Treatment of gunshot injuries of peripheral nerves. *Clin. Journ.*, 1916, xlv., May 3, p. 161.

DREAPER, G. A., and JOHNSON, RAYMOND. Gunshot wounds of the posterior interosseous nerve. *Journ. Royal Naval Med. Serv.*, 1916, ii., April, p. 158.

GUILLAIN, G., and BARRÉ, A. Paralysie du nerf moteur oculaire commun apparue dès le début d'une paratyphoïde A. *Annales de Méd.*, 1916, iii., p. 103.

HERNAMAN-JOHNSON, FRANCIS. The use of condensers in the diagnosis, prognosis, and treatment of nerve lesions. *Proc. Roy. Soc. Med.*, 1916, ix., March (Surg. Sect.), p. 1.

NEWTON, ALAN. A case of lipoma growing from the sheath of the ulnar nerve. *Med. Journ. Australia*, 1916, i., March 18, p. 241.

THOMAS, T. T. Obstetrical or brachial birth palsy. *Amer. Journ. Obstetrics*, 1916, lxxiii., April, p. 577.

SPINAL CORD—

General.—COLLIER, JAMES. An address on gunshot wounds and injuries of the spinal cord. *Lancet*, 1916, cxc., April 1, p. 711.

HULL, ALFRED J. Observations on the treatment of gunshot wounds of the spine. *Brit. Med. Journ.*, 1916, April 22, p. 577.

ARMOUR, DONALD. Gunshot wounds of the spine; their surgical aspect. *Lancet*, 1916, cxc., April 8, p. 770.

SPILLER, WM. G. Congenital and acquired enuresis from spinal lesion: (*a*) myelodysplasia; (*b*) stretching of the cauda equina. *Amer. Journ. Med. Sci.*, 1916, cli., April, p. 469.

HASSIN, G. B., JOHNSTONE, K. L., and CARR, A. M. Bullet lesion of cauda equina. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 1, p. 1001.

Herpes Zoster.—WEBER, F. PARKES. Herpes zoster with paralysis of arm. *Proc. Roy. Soc. Med.*, 1915, ix., Nov. (Dermatol. Sect.), p. 16.

Spina Bifida.—HARRAR, JAMES A. Spina bifida in the new-born. *Bulletin of Lying-in Hosp. of City of New York*, 1916, x., April, p. 143.

Syringomyelia.—TAYLOR, JAMES. Syringomyelia. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 47.

Poliomyelitis Anterior Acuta.—BATTEN, FREDERICK E. Acute Poliomyelitis. (Lumleian lectures.) *Lancet*, 1916, cxc., April 15, p. 809.

HOWELL, C. M. HINDS. Spastic paralysis in a boy, aged 8. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 57.

ROSENAU, M. J., and HAVENS, L. C. Experiments with poliomyelitis in the rabbit. *Journ. Exper. Med.*, 1916, xxiii., April, p. 461.

Von Recklinghausen's Disease.—SEQUEIRA, J. H. Dermatolysis and molluscum fibrosum, with congenital morbus cordis and kyphosis. *Proc. Roy. Soc. Med.*, 1916, ix., March (Dermatol. Sect.), p. 84.

BRAIN—

General.—ANDERSON, H. M., and NOEL, H. L. C. Case of shrapnel injury to right parietal cortex, showing paresis of left lower extremity, together with cortical sensory loss and thalamic over-response. *Journ. Roy. Army Med. Corps*, 1916, xxvi., April, p. 545.

MILLIGAN, SIR WM. Removal of a piece of shell from the cerebellum of a soldier wounded at Ypres. *Proc. Roy. Soc. Med.*, 1916, ix., March (Otol. Sect.), p. 31.

HUNT, J. RAMSAY. The sensory field of the facial nerve: a further contribution to the symptomatology of the geniculate ganglion. *Brain*, 1915, xxxviii., p. 418.

RANDALL, R. ALEX., and JONES, ISAAC H. Ear-tests of Barany in locating cerebellar and other encephalic lesions. *Amer. Journ. Med. Sci.*, 1916, cli., April, p. 515.

Skull Injury, &c.—CHAPMAN, C. L. Case of bullet wound of skull. *Med. Journ. Australia*, 1916, i., Feb. 26, p. 184.

CHRISTIE, W. E. Cranial tumour after shell wound and fracture of skull; difficult diagnosis. Was it a dermoid by inclusion? *Journ. Royal Army Med. Corps*, 1916, xxvi., April, p. 557.

Meningitis.—Discussion on the treatment of cerebro-spinal meningitis, opened by Sir William Osler. *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Therap. and Pharmacol. Sect.), p. 1.

SANDISON, A. Cerebro-spinal meningitis. *Med. Journ. Australia*, 1916, i., March 2, p. 220.

FERRIER, M. O. Etude bactériologique de 75 cas de méningite cérébro-spinale traités par les sérums spécifiques. *Journ. de Pharmacie et de Chimie*, 1916, xiii., p. 97.

EVANS, E. PARRY. A case of cerebro-spinal meningitis, with paratyphoid "A" fever, complicated by hernia of the small intestine through the mesentery; operation, recovery. *Journ. Roy. Army Med. Corps*, 1916, xxvi., April, p. 550.

KER, T. C., and DOUGLAS, R. O. A case of meningococcal conjunctivitis. *Med. Journ. Australia*, 1916, i., April 1, p. 285.

CAMPTALOUP, SYDNEY T. Meningococcal carriers. *Med. Journ. Australia*, 1916, i., April 1, p. 279.

MILLIGAN, SIR WM. Tuberculous (?) septic (?) meningitis following chronic suppurative otitis media; operation; repeated lumbar punctures; prolonged illness; recovery. *Proc. Roy. Soc. Med.*, 1916, ix., March (Otol. Sect.), p. 32.

Tumour.—GREY, ERNEST G. Studies on the localisation of cerebellar tumours. The position of the head and suboccipital discomforts. *Annals of Surgery*, 1916, lxiii., Feb., p. 129.

AUSTREGESILO, A. Un cas complexe de syndrome cérébelleux et vestibulaire avec réactions labyrinthiques exagérées consécutives à une tumeur osseuse de la région occipito-temporale droite. *Rev. Neurol.*, 1916, xxiii., Mars, p. 348.

JACOB, F. M. Glioma of the cerebellum with metastases. *Journ. Med. Research*, 1916, xxxiv., March, p. 95.

GIANNULI, F. Tumore del centro ovale del lobo prefrontale destro. *Riv. di Patol. nerv. e ment.*, 1916, xxi., April, p. 195.

JACKSON, HARRY. Craniopharyngeal duct tumours. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 8, p. 1082.

THURSFIELD, HUGH. ? Cerebral tumour. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 56.

PAL, S. B. Sarcoma of the dura mater. *Indian Med. Gaz.*, 1916, li., April, p. 139.

ROYCE, C. E. Sarcoma of the base of the skull. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 22, p. 1288.

Dyspituitarism.—STEPHENSON, SYDNEY. Dyspituitarism in a girl aged 15 years. *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Sect. Study Dis. in Children), p. 23.

FEARNSIDES, E. G. Hypopituitarism, dystrophia adiposo-genitalis, polyuria and polydipsia; bilateral cortico-spinal interference; optic neuritis and ptosis on left side; no changes in sella turcica; positive Wassermann reaction in serum. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 50.

Progressive Muscular Atrophy.—M'CRUDDEN, R. H., and SARGENT, C. S. Hypoglycæmia and progressive muscular dystrophy. *Archives Int. Med.*, 1916, xvii., p. 465.

Myasthenia.—TAYLOR, JAMES. Myasthenia gravis. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 47.

FEARNSIDES, E. G. Myasthenia gravis and epileptiform attacks observed over a period of eleven years. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 47.

Amaurotic Family Idiocy.—COATS, the late GEORGE. On the cause of the ophthalmoscopic appearances in amaurotic family idiocy. *Proc. Roy. Soc. Med.*, 1916, ix., March (Sect. of Ophthalmol.), p. 30.

Aphasia, Aphonia, &c.—MADDEN, FRANK COLE. A case of marked temporary aphasia after ligature of the common carotid artery for traumatic aneurysm. *Brit. Med. Journ.*, 1916, April 22, p. 585.

COLLIER. Jargon-aphasia. *Proc. Roy. Soc. Med.*, 1916, ix., March (Neurol. Sect.), p. 57.

Pellagra.—ROLPH, F. W. Cancer of the stomach and pellagra in the same patient. *Canadian Med. Assoc. Journ.*, 1916, vi., April, p. 323.

HOWLAND, C. A. Pellagra: a review of the subject. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 20, p. 563.

Beri-Beri.—DRAPER, A. P. Beri-beri early diagnosed and readily curtailed. *Journ. Trop. Med. and Hygiene*, 1916, xix., April 15, p. 92.

DOYLE, S. B. Beriberi. *N.Y. Med. Journ.*, 1916, ciii., April 8, p. 686 (5 illust.).

McCOLLUM. E. V., and KENNEDY, CORNELIA. The dietary factors operating in the production of polyneuritis. *Journ. Biol. Chem.*, 1916, xxiv., April, p. 491.

Syphilis.—ORTON, SAMUEL T. The relation of syphilis to mental disease. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 13, p. 525.

SIMONDS, J. P. Report of a case of congenital syphilis of the hypophysis. *Trans. Chicago Path. Soc.*, 1915, x., Dec., p. 30.

SPENCE, HAROLD. Intramine: a new antisyphilitic remedy. *Lancet*, 1916, cxc., April 22, p. 861 (illustr.).

THOMPSON, LLOYD. Complete syphilitic alopecia, with report of case. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 22, p. 1303.

DUDDING, JOHN S. Kharsivan in the treatment of syphilis. *Journ. Roy. Naval Med. Serv.*, 1916, ii., April, p. 164.

M'DONAGH, J. E. R., and SPENCE, H. Three cases of syphilis treated by "intramine" (di-ortho-amino-thio-benzene). *Proc. Roy. Soc. Med.*, 1916, ix., Feb. (Dermatol. Sect.), p. 51.

HEIDINGSFELD, M. L. Serology and the diagnosis of syphilis. *N.Y. Med. Journ.*, 1916, ciii., April 8, p. 673 (illustr.).

SWEITZER, S. E. Reinfection in syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 15, p. 1196.

Salvarsan.—STOKES, JOHN H. Acute syphilitic nephritis from the standpoint of diagnosis and salvarsan treatment, with report of a case. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 15, p. 1191.

WILLCOX, WM. H., and WEBSTER, J. The toxicology of salvarsan: dioxydiamido-arseno-benzol (Salvarsan or Kharsivan). *Brit. Med. Journ.*, 1916, April 1, p. 473.

SPENCE, HAROLD. Result of arsenical intoxication ten months after one injection of novarsenobenzol (billon). *Proc. Roy. Soc. Med.*, 1915, ix., Nov. (Dermatol. Sect.), p. 6.

GARDNER, JAMES A. Diarsenol versus salvarsan. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 22, p. 1303.

LUCEY, H. C. The therapeutic and reaction effects of kharsivan. A record of 600 injections. *Brit. Med. Journ.*, 1916, April 29, p. 614.

Luetin Reaction.—GORDON, M. B. The value of the luetin reaction in congenital syphilis. *Archives of Ped.*, 1916, xxxiii., March, p. 186.

Wassermann Reaction.—COMMISKEY, L. J. J. A preliminary report of the routine Wassermann reaction in hospital obstetrics. *Amer. Journ. Obstetrics*, 1916, lxxiii., April, p. 676.

Cerebro-Spinal Fluid.—WESTON, PAUL G. The colloidal gold precipitating substance in the cerebro-spinal fluid in paresis. *Journ. Med. Research*, 1916, xxxiv., March, p. 107.

STEVENS, H. C. The spinal fluid in Mongolian idiocy. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 29, p. 1373.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—THOM, D. A. The frequency of epilepsy in the offspring of epileptics. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 20, p. 573.

SPANGLER, RALPH H. Blood findings in epilepsy. *Lancet*, 1916, cxc., April 29, p. 910 (illustr.).

PRIOR, GUY V., and JONES, EVAN. Calcium and epilepsy: a preliminary report. *Med. Journ. Australia*, 1916, i., March 4, p. 199.

Migraine.—REMY, A. H. D. S. Migraine. *N.Y. Med. Journ.*, 1916, ciii., March 25, p. 588.

Alcoholism.—ANDERSON, VICTOR A. The alcoholic as seen in court. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 6, p. 492.

Neurasthenia.—MORTON, R. S. Neurasthenia in relation to gynæcology. *Amer. Journ. Obstetrics*, 1916, lxxiii., April, p. 613.

HARROWER, H. R. The relation of the internal secretions to neurasthenia in women. *Amer. Journ. Obstetrics*, 1916, lxxiii., April, p. 630.

GIBSON, G. The relationship between neurasthenia and pelvic disease. *Amer. Journ. Obstetrics*, 1916, lxxiii., April, p. 637.

COLLIE, Sir JOHN. Neurasthenia: what it costs the State. *Journ. Royal Army Med. Corps*, 1916, xxvi., April, p. 525.

"Shell Shock."—Special Discussion on Shell Shock without visible Signs of Injury. Opened by F. W. Mott. *Proc. Roy. Soc. Med.*, 1916, ix. (Sect. of Psychiat. and Neurol.), p. 1.

SMITH, G. ELLIOT. Shock and the soldier. *Lancet*, 1916, cxc., April 15 and 22, pp. 813 and 853.

AUER, E. MURRAY. Phenomena resultant upon fatigue and shock of the central nervous system observed at the front in France. *Med. Record*, 1916, lxxxix., April 8, p. 641.

JONES, W. ERNEST. A case of shell shock. *Med. Journ. Australia*, 1916, i., March 4, p. 203.

HARWOOD, T. E. A preliminary note on the nature and treatment of concussion. *Brit. Med. Journ.*, 1916, April 15, p. 551.

RUDOLF, R. D. Paralysis from fright. *Canadian Med. Assoc. Journ.*, 1916, vi., April, p. 321.

MEIGE, HENRY. Les tremblements consécutifs aux explosions (tremblement, tressaillement, tremophobie). *Rev. Neurol.*, 1916, xxiii., Fév., p. 201.

BENON, R. Les maladies mentales et nerveuses et la guerre. *Rev. Neurol.*, 1916, xxiii., Fév., p. 210.

BONNIER, P. L'état de guerre et les pannes nerveuses. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 216.

Trench Feet.—BELL, F. M'KELVEY. Effects of wet and cold: trench feet. *Canad. Med. Assoc. Journ.*, 1916, vi., April, p. 289.

Tetanus.—THURSFIELD, THOS. W. Two cases of tetanus, with observations. *Clin. Journ.*, 1916, xlv., April 12, p. 138.

MACKWORTH, N. W. Two cases of tetanus treated successfully by subdural injections of antitetanus serum. *Brit. Med. Journ.*, 1916, April 29, p. 620.

MULLALLY, G. T. A case of tetanus-like spasm localised to the wounded limb. *Lancet*, 1916, cxc., April 22, p. 867.

LAW, W. F. Mental symptoms in acute tetanus. *Brit. Med. Journ.*, 1916, April 22, p. 589.

Exophthalmic Goitre, Cretinism, &c.—RIESMAN, DAVID. Bruit over the eyeball in exophthalmic goitre. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 29, p. 1381.

SÖLLING, H. A. Untersuchungen über die Blutveränderungen bei Morbus Basedowii. *Nord. Med. Arkiv.*, 1916, xlix. (Kirurgi, Afd. i., h. 1-3), Nr. 7, pp. 1-44.

LITTLE, E. G. GRAHAM. Case of sclerodermia associated with Graves' disease, and later myxœdema, conspicuously benefiting by implantation of human thyroid into the bone marrow. *Proc. Roy. Soc. Med.*, 1916, ix., March (Dermatol. Sect.), p. 69.

SEQUEIRA, J. H. Sclerodermia with Graves' disease. *Proc. Roy. Soc. Med.*, 1916, Feb. (Dermatol. Sect.), p. 66.

Raynaud's Disease.—PERNET, GEORGE. Erythromelalgia and Raynaud's disease. *Proc. Roy. Soc. Med.*, 1915, ix., Nov. (Dermatol. Sect.), p. 15.

SPECIAL SENSES AND CRANIAL NERVES—

M'KENZIE, DAN. Cases illustrating otogenic facial paralysis. *Proc. Roy. Soc. Med.*, 1916, ix., March (Otol. Sect.), p. 37.

SCOTT, SYDNEY. Histological preparations of the labyrinths and tympana of a soldier suffering from deafness due to a bullet wound of the vertex of the skull. *Proc. Roy. Soc. Med.*, 1916, ix., March (Otol. Sect.), p. 28.

DALEY, W. ALLEN, and M'CORMACK, C. V. A case of marked post-diphtheritic paralysis. *Lancet*, 1916, cxc., April 29, p. 915.

MISCELLANEOUS SYMPTOMS AND CASES—

DEJERINE, J. Les radiculites. *Rev. Neurol.*, 1916, xxiii., Mars, p. 321.

HOSSACK, JAMES. Diffuse traumatic aneurysm of the femoral artery with cerebral complications. *Clin. Journ.*, 1916, xlv., May 3, p. 167.

MAIRET, A., PIERON, H., and CHICHET, L. Une démonstration de l'origine médullaire de certaines contractures considérées comme névrosiques. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 256.

DUEL, A. B. Orientation and equilibration. *N. Y. Med. Journ.*, 1916, ciii., March 25, p. 577 (4 illustr.).

FEARNSIDES, E. G. Obesity: epileptiform attacks: recurrent jaundice in a girl aged 13 years. *Brit. Journ. Child. Dis.*, 1916, xiii., Feb., p. 37; *Med. Press*, 1916, *n.s.*, ci., April 12, p. 329.

WHIPHAM, T. R. Congenital word- and letter-blindness. *Brit. Journ. Child. Dis.*, 1916, xiii., Feb., p. 33.

ESHNER, A. A. Nervous symptoms in visceral diseases. *N. Y. Med. Journ.*, 1916, ciii., March 25, p. 596.

PRIESTLEY, JAMES. The common speech disorders of childhood. *Brit. Journ. Child. Dis.*, 1916, xiii., April, p. 104.

HERRMAN, C. Progressive lipodystrophy. *Archives Int. Med.*, 1916, xvii., April, p. 516.

FERRY, M. G. Clinical lecture on the syndrome, "Aviators' sickness." An experimental study of the arterial tension during flight. *Med. Press*, 1916, *n.s.*, ci., May 3, p. 395.

FLETCHER, JOHN M. The etiology of stuttering. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 8, p. 1079.

PSYCHIATRY.

GENERAL—

LIND, W. A. T. Insanity due to mitral stenosis. *Med. Journ. Australia*, 1916, i., April 1, p. 282.

POLLOCK, LEWIS J. Recent studies of the structural changes in mental diseases. *Trans. Chicago Path. Soc.*, 1916, x., Dec., p. 15.

ABBOT, E. STANLEY. Preventable forms of mental disease, and how to prevent them. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 20, p. 555.

LUGARO, E. La psichiatria tedesca nella storia e nell' attualità (*continua*). *Riv. di Patol. nerv. e ment.*, 1916, xxi., p. 241.

DERCUM, FRANCIS X. Metabolism in insanity. *Journ. Amer. Med. Assoc.*, 1916, lxvi., April 15, p. 1183.

ROBERTSON, GEORGE M. The employment of female nurses in the male wards of mental hospitals in Scotland. *Med. Press*, 1916, *n.s.*, ci., April 26, p. 378.

SOLOMON, H. C. What shall be the attitude of the public toward the recovered insane patient? *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 13, p. 522.

FROST, HENRY P. After-care of mental patients. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 13, p. 528.

GORDON, ALFRED. Mental deficiency. *N.Y. Med. Journ.*, 1916, ciii., March 18, p. 534.

SAJOUS, C. E. DE M. Our duty to mental defectives of the present generation. *N.Y. Med. Journ.*, 1916, ciii., April 1, p. 625.

TREATMENT.*

BUDDEN, CHAS. W. The treatment of rheumatic, neuralgic, and allied pains by ionization with sodium salicylate. *Practitioner*, 1916, xcvi., April, p. 422.

Psychoanalysis.—DRYFOOS, A. D. The element of psychoanalysis. *N.Y. Med. Journ.*, 1916, ciii., March 25, p. 594.

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

ANATOMY.

WEED, LEWIS H. The formation of the cranial subarachnoid spaces. *Anat. Record*, 1916, x., May, p. 475.

SMALLWOOD, W. M. A short spinal cord in the toad. *Anat. Record*, 1916, x., May, p. 515.

PHYSIOLOGY.

BROWN, E. D. Artificial cerebral circulation after circulatory isolation of the mammalian brain. *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., p. 185.

MULLER, H. R., and WEED, LEWIS H. Notes on the falling reflex of cats. *Amer. Journ. Physiol.*, 1916, xl., p. 373.

MEYER, A. L., and MELTZER, S. J. An active expiratory muscle in the chicken which is inhibited by stimulation of the central end of the vagus. A demonstration. *Proc. Soc. for Exp. Biol. and Med.*, 1916, xiii., 67 (1131).

HAMMETT, FRED. S. The peripheral point of attack of strychnine. *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., April, p. 175.

LANGLEY, J. N. Sketch of the progress of discovery in the eighteenth century as regards the autonomic nervous system. *Journ. Physiol.*, 1916, l., p. 225.

PIKE, F. H. A note on the excitation of the phrenic nerve by the action current of the heart. *Amer. Journ. Physiol.*, 1916, xl., p. 433.

MUTO, K. Uber die Wirkung des Adrenalins auf die Schweissekretion; zugleich ein Beitrag zur Kenntnis der doppelsinnigen Innervation der Schweissdrüse. *Mitteil. a.d. Med. Fak. d. Kaiserlich. Univ. zu Tokyo*, 1916, xv., S. 365.

BURTON-OPITZ, R. The character of the innervation of the kidney. *Amer. Journ. Physiol.*, 1916, xl., p. 437.

HORRAX, GILBERT. Studies on the pineal gland. I. Experimental observations. II. Clinical observations. *Archives of Int. Med.*, 1916, xvii., May, pp. 607 and 627.

LEWIS, DEAN. The appearance of the pressor substance in the fœtal hypophysis. *Journ. Exp. Med.*, 1916, xxiii., May, p. 677.

MOTZFELDT, KETIL. The pituitary body and renal function. *Boston Med. and Surg. Journ.*, 1916, clxxiv, May 4, p. 644.

BRAILSFORD, R. T., and BURNETT, T. C. The influence of tethelin, and of other alcohol-soluble extractives from the anterior lobe of the pituitary body, upon the growth of carcinomata in rats. *Journ. Exp. Med.*, 1916, xxiii., p. 631.

PSYCHOLOGY.

WATT, HENRY, J. Stereoscopy as a purely visual, bisystemic, integrative process. *Brit. Journ. Psychol.*, 1916, viii., May, p. 131.

CAREY, N. Factors in the mental processes of school children. IV. Factors concerned in the school subjects. *Brit. Journ. Psychol.*, 1916, viii., May, p. 170.

WOLTERS, A. W. The process of negation. *Brit. Journ. Psychol.*, 1916, viii., May, p. 183.

WARD, JAMES. A further note on the sensory character of black. *Brit. Journ. Psychol.*, 1916, viii., May, p. 212.

BARTLETT, F. C. An experimental study of some problems of perceiving and imaging. *Brit. Journ. Psychol.*, 1916, viii., May, p. 222.

PATHOLOGY.

WILSON, J. GORDON, and PIKE, F. H. A demonstration of the effects of some lesions of the central nervous system. *Proc. Soc. for Exp. Biol. and Med.*, 1916, xiii., 68 (1132).

D'ANTONA, S. D. Sulle degenerazioni secondarie ascendenti del midollo spinale, con particolare riguardo alla sistenza di un "Tratto spino-corticale." *Riv. di Patol. nerv. e ment.*, 1916, xxi., Giugno, p. 299.

BIONDI, GIOSUÈ. Su alcuni artefatti nel sistema nervoso centrale dovuti alla fissazione in formalina. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter*, 1916, ix., Maggio, p. 193.

ADAMS, D. R. A case of ganglio-neuroma of the sympathetic. *Brit. Med. Journ.*, 1916, May 6, p. 650.

HESTER, J. H. Glioma of the retina. *Pediatrics*, 1916, xxviii., May, p. 193.

GRAHAM, G. S. Toxic lesions of the adrenal gland and their repair. *Journ. Med. Research*, 1916, xxxiv., May, p. 241 (2 plates).

CLINICAL NEUROLOGY.

GENERAL—

Nerves.—CONNOR, F. P. Injuries to peripheral nerves. *Ind. Med. Gaz.*, 1916, li., May, p. 178.

LONGRIDGE, C. NEPEAN. A note on the use of the galvanometer as an aid to the diagnosis of nerve lesions. *Brit. Med. Journ.*, 1916, May 20, p. 717.

JONES, ROBERT. Notes on military orthopædics. II. On suture of nerves, and alternate methods of treatment by transplantation of tendon. *Brit. Med. Journ.*, 1916, May 6 and 13, pp. 641 and 679 (illust.).

SMITH, L. HOWLAND. Two cases of obstetrical paralysis involving only the musculo-spiral nerve. *Amer. Journ. Dis. Child.*, 1916, xi., May, p. 333.

MILLS, H. B., and MENDELSON, J. A. Diphtheritic paralysis. *N. Y. Med. Journ.*, 1916, ciii., April 22, p. 780.

SPINAL CORD—

General.—ROSSI, ENRICO. Trauma vertebrale e lesione midollare inferiore. Saggio di fisio-patologia della midolla lombare e del cono midollare. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Maggio, p. 203.

SEVER, JAMES WARREN. Fracture of the lumbar vertebræ and transverse processes. A report of four additional cases. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 27, p. 606.

ELSBERG. The surgical significance and operative treatment of enlarged and varicose veins of the spinal cord. *Amer. Journ. Med. Sci.*, 1916, cli., May, p. 642.

JINNAKA, S. On the fifth lumbar vertebra of adult in radiograph. *Mitteil. a. d. Med. Fak. d. Kaiserlich Univ. zu Tokyo*, 1916, xv., S. 345.

Herpes Zoster.—ROSENOW, E. C., and OFTEDAL, SVERRE. The etiology and experimental production of herpes zoster. *Journ. Infect. Dis.*, 1916, xviii., May, p. 477.

Hydromyelia.—GORDON, ALFRED. Hydromyelia and hydroencephalia. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 411.

Poliomyelitis Anterior Acuta.—JOHNSTON, ROBERT B. Acute diffuse polioencephalitis: an obscure case. *Clin. Journ.*, 1916, xlv., May 31, p. 197.

HARRINGTON, A. W., and TEACHER, JOHN H. Subacute anterior poliomyelitis. *Glasgow Med. Journ.*, 1916, lxxxv., May, p. 331.

Tabes.—LUCKE, BALDWIN. Tabes dorsalis. A pathological study of 250 cases. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 393.

STARKEY, F. R. A broader view of tabes dorsalis. *Med. Press*, 1916, ci., May 31, p. 489.

BRAIN—

General.—MACPHAIL, J. M. Severe cerebral injury, associated with laughter. *Brit. Med. Journ.*, 1916, May 13, p. 688.

WOOLFENDEN, H. F. Two cases in which the lateral ventricle was opened in the course of operations for the removal of a bullet and indriven bone from the brain. *Lancet*, 1916, cxc., May 20, p. 1037.

Skull Injury, &c.—BROWN, H. E. Notes on cases of head, abdominal, and joint injuries. *Lancet*, 1916, cxc., May 27, p. 1082.

DON, ALEX. The treatment of head injuries in a casualty clearing station. *Lancet*, 1916, cxc., May 20, p. 1034.

OWEN, GEOFFREY. Glancing bullet wounds of the skull. *Med. Journ. Australia*, 1916, i., April 8, p. 299.

Meningitis.—NESBITT, GEORGE E. A note on the distribution of cases of cerebro-spinal fever in a military camp. *Med. Press*, 1916, *n.s.*, ci., May 24, p. 469.

HIGGINS, T. S. Cerebro-spinal fever: an analysis of the St Pancras cases in the epidemic of 1915. *Public Health*, 1916, xxix., May, p. 193.

CHALMERS, A. J., and O'FARRELL, W. R. Preliminary remarks upon epidemic cerebro-spinal meningitis as seen in the Anglo-Egyptian Sudan. *Journ. Trop. Med. and Hygiene*, 1916, xix., May 1 and 15, pp. 101 and 117.

FORBES, DUNCAN, and COHEN, EVELINE. Congestion in the treatment of cases of epidemic cerebro-spinal meningitis. *Lancet*, 1916, cxc., May 27, p. 1075 (illust.).

NESBITT, GEORGE E. A note on the distribution of cases of cerebro-spinal fever in a military camp. *Dublin Journ. Med. Sci.*, 1916, Third Series, No. 533, May, p. 318.

LEOPOLD, SAMUEL. Circumscribed purulent leptomeningitis due to frontal sinusitis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 27, p. 1676.

McMEANS, J. W. The occurrence of arteritis in meningitis. *Amer. Journ. Med. Sci.*, 1916, cli., Feb., p. 249.

Abscess.—GOT. Considérations clinque sur les abcès du cerveau otogènes. *Rev. de Laryngol., d'Otol. et de Rhinol.*, 1916, xxxvii., Mai 31, p. 211.

HOLMES, JAMES B. Multiple abscesses of the brain in infancy. *Archives of Inter. Med.*, 1916, xvii., May, p. 591.

Tumour.—GREY, ERNEST G. Studies on the localisation of cerebellar tumours: II. The pointing reaction and the caloric test. *Amer. Journ. Med. Sci.*, 1916, cli., May, p. 693.

HIRD, R. BEATSON. Sarcoma of frontal lobe giving rise to ocular signs only *Brit. Med. Journ.*, 1916, May 13, p. 678.

MINGAZZINI, GIOVANNI. Contributo clinico ed anatomo-patologico allo studio dei tumori del pons. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Giugno, p. 289.

Dyspituitarism.—STEPHENSON, S. Case of dyspituitarism in a girl, aged 15 years. *Brit. Journ. Child. Dis.*, 1916, xiii., May, p. 141.

Diabetes Insipidus.—OLIVER, J. Diabetes insipidus developing suddenly, with uterine fibroids; hysterectomy. *Lancet*, 1916. cxc., May 27, p. 1084.

Progressive Muscular Atrophy.—ROSENHECK, C. The Charcot-Marie-Tooth type of progressive neuromuscular atrophy, with a report of two cases. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 20, p. 1604.

Disseminated Sclerosis.—KRUMHOLZ, SIGMUND. A case of atypical multiple sclerosis with bulbar paralysis. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 425.

Myasthenia.—BOOKMAN, A., and EPSTEIN, A. A. The metabolism in a case of myasthenia gravis, with considerations of the administration of calcium and of glandular preparations. *Amer. Journ. Med. Sci.*, 1916, cli , Feb., p. 267.

Aphasia, Aphonia, &c.—BRAMWELL, BYROM. "Crossed" aphasia. *Edin. Med. Journ.*, 1916, xvi., May, p. 342.

Pellagra.—BOND, H. E. The causation and treatment of pellagra. *Med. Record*, 1916, lxxxix., May 6, p. 816.

JOBLING, J. W,, and PETERSEN, WM. The epidemiology of pellagra in Nashville, Tennessee. *Journ. Infect. Dis.*, 1916, xviii., May, p. 501.

Lead Poisoning.—MOYLE, H. H. The odour of paint as a cause of plumbism. *Lancet*, 1916, cxc., May 27, p. 1083.

Trench Feet.—WALLER, W., and RIDEAL, E. K. Report on "trench feet." *Journ. Roy. Army Med. Corps*, 1916, xxvi., May, p. 635.

SOLTAU, B. Trench feet. *Journ. Roy. Army Med. Corps*, 1916, xxxvi., May, p. 664.

BAILLIET, A. Prophylaxie des macérations et gelures des pieds. *Prog. Méd.*, 1916, Mai 5, p. 69.

Syphilis.—AYER, JAMES B. Cerebral syphilis. A method of treatment by prolonged intraspinal injection of serum under high pressure. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 27, p. 614.

CHURCH, ARCHIBALD. Some modern views of syphilis of the nervous system. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 20, p. 1596.

KARPAS, MORRIS J. Cerebral syphilis of recent origin, with remarks on the therapy. *Med. Record*, 1916, lxxxix., April 22, p. 736.

SHAW, THAD. The intravenous administration of mercury in syphilis. *Med. Record*, 1916, lxxxix., May 6, p. 823.

M'GRIGOR, H. J. The treatment of syphilis in the army; with special reference to the administration of "606" in concentrated solutions. *Practitioner*, 1916, xcvi., May, p. 462 (1 illust.).

M'DONAGH, J. E. R. Links in a chain of syphilis. I. and II. (Hunterian lectures.) *Lancet*, 1916, cxc., May 13, 20, p. 981 and 1025.

Wassermann Reaction.—SELLARDS, A. W., and MINOT, G. R. The antagonistic action of negative sera upon the Wassermann reaction. *Journ. Med. Research*, 1916, xxxiv., May, p. 131.

GORDON, ALFRED. The value of the Wassermann reaction in mental deficiency in children. *Archives of Ped.*, 1916, xxxiii., April, p. 273.

GRAY, CARL D. A urinary test for syphilis, and its comparison with the Wassermann reaction. *Med. Record*, 1916, lxxxix., May 6, p. 821.

McCLURE, C. W., and LOTT, E. S. Results with cholesterinized antigens in non-syphilitic sera. *Amer. Journ. Med. Sci.*, 1916, cli., May, p. 712.

Cerebro-Spinal Fluid.—COLLINS, JOSEPH. Pathognomonic alterations of the cerebro-spinal fluid in syphilis of the nervous system. *Amer. Journ. Med. Sci.*, 1916, cli., Feb., p. 222.

FINE, M. S., and MYERS, V. C. Comparative distribution of urea, creatinine, creatine, uric acid, and sugar in blood and spinal fluid. *Proc. Soc. exp. Biol. and Med.*, 1916, xiii., 70 (1134).

BROMER, RALPH S. The syndrome of coagulation massive et xanthochromie occurring in tuberculosis of the cervical spine. *Amer. Journ. Med. Sci.*, 1916, cli., March, p. 378.

LEVINSON, A. A uniform method for the collection of spinal fluid into test-tubes. *Med. Record*, 1916, lxxxix., April 22, p. 739.

LEVINSON, A. Studies in spinal fluid. I. and II. *Archives of Ped.*, 1916, xxxiii., April, pp. 241 and 247.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—THOM, D. A. Abnormal relation between liver and brain weights in forty-two cases of epilepsy. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 422.

MACROBERT, RUSSELL G. The rôle of the wish in the manifestations of the epileptic type of nervous constitution. A rational interpretation and treatment for the epileptic sane. *Med. Record*, 1916, lxxxix., May 13, p. 856.

SHANAHAN, W. T., MUNSON, J. F., and SHAW, A. L. Syphilis in epilepsy. *N. Y. Med. Journ.*, 1916, ciii., April 29, p. 820.

REED, C. A. L. The bacillus epilepticus. Third report. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 20, p. 1607.

Hysteria.—HALL, A. J. Hysterical mutism in a boy. *Lancet*, 1916, cxc., May 20, p. 1039.

Neuritis.—DANA, CHARLES L. Periostitis and osteitis as a cause of local pains and so-called neuritis and neuralgia. *Med. Record*, 1916, lxxxix., April 29, p. 765.

WILSON, ANITA ALVERA. Peripheral neuritis with Korsakow's symptom complex. *Journ. Nerv. and Ment. Dis.*, 1916, xliii., May, p. 431.

Neuroses.—HARTSHORN, W. E. Some clinical phases of the vasomotor neuroses. *Med. Record*, 1916, lxxxix., April 29, p. 777.

"Shell-Shock."—MYERS, CHARLES S. Contributions to the study of shell-shock. II. Being an account of certain cases treated by hypnosis. *Journ. Roy. Army Med. Corps*, 1916, xxvi., May, p. 642.

CAMPBELL, A. W. Remarks on some neuroses and psychoses in war. *Med. Journ. Australia*, 1916, i., April 15, p. 319.

CAMPBELL, HARRY. War neuroses. *Practitioner*, 1916, xcvi, May, p. 501.

O'MALLEY, J. F. Warfare neuroses of the throat and ear. *Lancet*, 1916, cxc., May 27, p. 1080.

TURNER, WM. ALDREN. Arrangements for the care of cases of nervous and mental shock coming from overseas. *Lancet*, 1916, cxc., May 27, p. 1073.

Exophthalmic Goitre, Cretinism, &c.—HEUER, G. J. The cerebral nerve disturbances in exophthalmic goitre. *Amer. Journ. Med. Sci.*, 1916, cli., March, p. 339.

Tetanus.—MÉTIVIER, VIVIAN M. Case of acute tetanus with hæmatemesis. *Lancet*, 1916, cxc., May 27, p. 1084.

GOVAERTS, P. Sur le traitement du tétanos. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 341.

GOADBY, K. The treatment of tetanus. *Practitioner*, 1916, xcvi., May, p. 526.

ROBERTSON, H. E. The prophylactic use of tetanus antitoxin. *Amer. Journ. Med. Sci.*, 1916, cli., May, p. 668.

ROBERTSON, H. E. The present status of magnesium sulphate in the treatment of tetanus. *Archives of Inter. Med.*, 1916, xvii., May, p. 677.

SPECIAL SENSES AND CRANIAL NERVES—

KNAPP, ARNOLD. Optic neuritis after influenza, with changes in the spinal fluid. *Archives of Ophthalmol.*, 1916, xlv., May, p. 247.

WIDAL, F. Ocular symptoms in nephritis. *Med. Press*, 1916, *n.s.* ci., May 10, p. 418.

BEDELL, ARTHUR J. The ocular causes of headache. *Albany Med. Annals*, 1916, xxxvii., May, p. 211.

CALHOUN, F. PHINIZY. An electric colourfinder to be used in mapping out the visual field and the blind spot. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 20, p. 1622.

BYRNES, C. M. Bilateral and complete trigeminal paralysis without involvement of other cranial nerves. *Bulletin Johns Hopkins Hosp.*, 1916, xxvii., May, p. 138 (illust.).

MUNDIE, G. S. Double facial paralysis. *Canadian Med. Assoc. Journ.*, 1916, vi., May, p. 429.

MISCELLANEOUS SYMPTOMS AND CASES—

MITTENDORF, ALFRED D. Pains in the head. *N.Y. Med. Journ.*, 1916, ciii., May 6, p. 887.

COURRIER, JOHN L. Pains in the head. *N.Y. Med. Journ.*, 1916, ciii., May 6, p. 888.

ROBERTS, P. W. Paralytic feet. *N.Y. Med. Journ.*, 1916, ciii., April 29, p. 826.

MARSHALL, HERMAN W. Chronic backache. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 27, p. 591.

WILCOX, R. W. Potassium iodide poisoning. *N.Y. Med. Journ.*, 1916, ciii., May 20, p. 975.

PSYCHIATRY.

DEMENTIA PRÆCOX—

HOLMES, BAYARD, and RETINGER, JULIUS. Dementia præcox studies. The relation of cecal stasis to dementia præcox. *Med. Record*, 1916, lxxxix., May 6, p. 815.

GENERAL—

ROSANOFF, A. J. Alcohol in relation to mental disease. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 27, p. 611.

HAINES, EMILY L. Occupation as a remedial factor in hospitals for the mentally sick. *Boston Med. and Surg. Journ.*, 1916, clxxiv., April 27, p. 609.

JACOBY, G. W. The curatelle and modern psychiatry. *N.Y. Med. Journ.*, 1916, cii., May 20 and 27, pp. 976 and 1027.

TREATMENT.*

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

SAVILL, AGNES. Psychoanalysis. *Med. Press*, 1916, *n.s.* ci., May 17, p. 446.

Bibliography

PHYSIOLOGY.

MILNER, C. E. H. A note on the function of the medullary nerve sheath. *Lancet*, 1916, cxc., June 3, p. 1124.

MARINESCO, G., and MINEA, J. L'action de la température sur le phénomène de la réaction à distance des cellules nerveuses de la grenouille. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 456.

MARINESCO, G., and MINEA, J. Lésions de la névroglie corticale dans un cas d'angio-sclérose avec demence. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 454.

NAGEOTTE, J. Les moyens de réunion du nerf sectionné : tractus fibreux, bourgeons nerveux. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 479.

FORBES, A., M'INTOSH, R., and SEFTON, W. The effect of ether anæsthesia on the electrical activity of nerve. *Amer. Journ. Physiol.*, 1916, xl., p. 503.

RANSON, S. W., and BILLINGSLEY, P. R. The conduction of painful afferent impulses in the spinal nerves—studies in vasomotor reflex arcs.—II. *Amer. Journ. Physiol.*, 1916, xl., p. 571.

BROWN, E. D. Observations on the effects of epinephrine on the medullary centres. *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., p. 195.

GREENWALD, ISIDOR. Some observations on the tetany of parathyroidectomized dogs. *Journ. Biol. Chem.*, 1916, xxv., June, p. 223.

PSYCHOLOGY.

PUTNAM, JAMES W. A unique murder case, with application of new law governing expert testimony. *Amer. Journ. Insanity*, 1916, lxxii., p. 659.

CLINICAL NEUROLOGY.

GENERAL—

ARCHAMBAULT, LA SALLE. Headache in organic and functional diseases of the nervous system. *Albany Med. Annals*, 1916, xxxvii., June, p. 259.

NERVES—

PURSER, F. C. On injuries to peripheral nerves and their surgical treatment. *Med. Press*, n.s., ci., June 7, p. 511.

PORAK, RENÉ. La sudation dans les lésions des nerfs périphériques des membres supérieurs. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 424.

BYRNE, P. J. Murphy's operation, or transplantation of the flexor carpi radialis into the extensors of the thumb and fingers in a case of musculo-spiral paralysis. *Practitioner*, 1916, xcvi., June, p. 642.

PRESTON, GEORGE L. A case of Erb-Duchenne paralysis due to a bullet wound of the fifth cervical nerve; spinal accessory anastomosis; recovery. *Lancet*, 1916, cxc., June 17, p. 1215.

HENRY, A. K. A case of tendon transplantation for wrist drop. *Lancet*, 1916, cxc., June 17, p. 1218.

SPINAL CORD—

General.—ELSBERG, CHARLES A. Laminectomy with simple exposure of the spinal cord; its effects on the reflexes and on the symptoms of spinal disease. *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1852.

BRAIN—

General.—VILVANDRÉ, GEO., and MORGAN, J. D. Movements of foreign bodies in the brain. *Archives of Radiol. and Electrother.*, 1916, xxi., June, p. 22.

SHARPE, WM. Observations in the diagnosis and treatment of brain injuries in adults. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 13, p. 1536.

Skull Injury, &c.—HARWOOD, T. E. A factor in the treatment of head injuries and allied conditions. *Lancet*, 1916, cxc., June 3, p. 1122.

Oxycephaly.—SHARPE, WM. The cranial deformity in oxycephaly: its operative treatment, with a report of cases. *Amer. Journ. Med. Sci.*, 1916, cli., June, p. 840.

Meningitis.—MALBETERRE, FÉLIX. Antimeningococcic serum in the joint manifestations of gonorrhea. *N. Y. Med. Journ.*, 1916, ciii., May 27, p. 1024.

GORDON, M. H. The inhibitory action of saliva on growth of the meningococcus. *Brit. Med. Journ.*, 1916, June 17, p. 849 (illust.).

FLEXNER, SIMON. The rapid production of antidysenteric and antimeningococcic sera. *Journ. State Med.*, 1916, xxiv., June, p. 161.

Hydrocephalus.—BROWNING, WM. The anatomical cause of the frequency of hydrocephalus in childhood. *Med. Record*, 1916, lxxxix., May 27, p. 959.

Aphasia, Apraxia, &c.—GORDON, ALFRED. A further contribution to the study of aphasia apropos of a case of verbal amnesia and alexia. *Amer. Journ. Insanity*, 1916, lxxii., p. 649.

Myasthenia.—ATHANASIU, J., and MARINESCO, G. Recherches pléthysmographiques et galvanométriques dans la myasthénie. Discordance circulatoire entre les deux bras. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 545.

Pellagra.—WINFIELD, J. M. Pellagra. *N. Y. Med. Journ.*, 1916, ciii., June 3, p. 1076.

WOOD, EDWARD JENNER. Vitamin solution of the pellagra problem: a preliminary note. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 6, p. 1447.

Trench Foot.—HUGHES, BASIL. The causes and prevention of trench foot. *Brit. Med. Journ.*, 1916, May 20, p. 712.

BLACKMAN, J. G. Trench foot. *Brit. Med. Journ.*, 1916, June 10, p. 818.

Syphilis.—SYMMERS, DOUGLAS. Anatomic lesions in late acquired syphilis: a study of 314 cases based on the analysis of 4,880 necropsies at Bellevue Hospital. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 6, p. 1457.

BANSBACH, J. Abortive treatment of syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 3, p. 1778.

KOLMER, JOHN A. Syphilis and life insurance, with special reference to the Wassermann and luetin reactions. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 6, p. 1435.

M'DONAGH, J. E. R. A new and simple test for syphilis. *Med. Press*, 1916, n.s. ci., June 28, p. 590.

HARRISON, L. W. The effect of ferrivine and intramine on syphilis. *Lancet*, 1916, cxc., June 17, p. 1214.

HUNT, EDWARD LIVINGSTON. Intraspinal injections of bichloride of mercury. *Boston Med. and Surg. Journ.*, 1916, clxxiv., June 1, p. 788.

Salvarsan.—WARDNER, DREW M. The intracranial injection of salvarsanized serum. *Amer. Journ. Insanity*, 1916, lxxii., p. 643.

WOLBARST, ABR. L. The epifascial method of injecting mercury and salvarsan derivatives. *Med. Record*, 1916, lxxxix., June 3, p. 999.

KAUFMAN, LOUIS RENÉ. An apparatus for intravenous salvarsan injection. *N. Y. Med. Journ.*, 1916, ciii., June 10, p. 1127.

Wassermann Reaction.—LOWREY, LAWSON G. The Wassermann test in practical psychiatry. *Amer. Journ. Insanity*, 1916, lxxii., p. 601.

JUDD, ALBERT M. The Wassermann reaction in pregnancy. *Amer. Journ. Med. Sci.*, 1916, cli., June, p. 836.

Cerebro-Spinal Fluid.—LINTZ, WM. Trichinosis and the cerebro-spinal fluid. *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1856.

CUMMINS, W. T. A case of trichinosis with embryo in the spinal fluid. *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 10, p. 1856.

Epilepsy.—WATERS, L. R. A report of 64 cases of epilepsy in patients from 14 years to 40 years of age. *Bulletin Johns Hopkins Hosp.*, 1916, xxvii., June, p. 179.

CLARK, L. PIERCE. Clinical studies in epilepsy (continuation). *Psychiatric Bulletin*, 1916, ix., April, p. 131.

MACCURDY, JOHN T. A clinical study of epileptic deterioration. *Psychiatric Bulletin*, 1916, ix., April, p. 187.

Hysteria.—MAKUEN, G. H. Hysterical mutism. *N. Y. Med. Journ.*, 1916, ciii., May 27, p. 1009.

Chorea.—GROSSMAN, MORRIS. Chorea: its treatment. *N. Y. Med. Journ.*, 1916, ciii., May 27, p. 1018.

"Shell Shock."—WILTSHIRE, HAROLD. A contribution to the etiology of shell shock. *Lancet*, 1916, cxc., June 17, p. 1207.

Polyneuritis.—BREINL, A. Note on experiments on polyneuritis in pigeons. *Journ. Trop. Med. and Hygiene*, 1916, xix., June 1, p. 129.

Exophthalmic Goitre, &c.—COBB, IVO GEIKIE. Exophthalmic goitre. Synonyms: Graves' disease; Basedow's disease; Hyperthyroidism. *Med. Press*, 1916, n.s., ci., June 14, p. 540.

WECHSLER, I. S. Early diagnosis of a case of myxœdème fruste. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 13, p. 1549.

Addison's Disease.—SCHAFFNER, P. M., and HOWARD, T. Addison's disease of syphilitic origin. *N. Y. Med. Journ.*, 1916, ciii., May 27, p. 1026.

Tetanus.—TULLIDGE, E. K. Tetanus: a surgical complication of the present war. *N. Y. Med. Journ.*, 1916, ciii., May 27, p. 1022.

ROBERTSON, H. E. Therapeutic possibilities of antitetanus serum. *Amer. Journ. Med. Sci.*, 1916, cli., June, p. 811.

SPECIAL SENSES AND CRANIAL NERVES—

WHITE, LEON E. Loss of sight from retrobulbar neuritis due to accessory sinus disease, with report of two cases. *Boston Med. and Surg. Journ.*, 1916, clxxiv., June 1, p. 790.

GRIFFITH, ARTHUR D. An address on injuries of the eye and orbit. *Lancet*, 1916, cxc., June 24, p. 1245.

MISCELLANEOUS SYMPTOMS AND CASES—

FIELDER, FRANK S. Paralysis during Pasteur antirabic treatment, with reports of seven personal cases, one terminating fatally, and six other previously unreported cases. *Journ. Amer. Med. Assoc.*, 1916, lxvi., June 3, p. 1769.

M'COUCH, GRAYSON P., and LUDLUM, S. D. W. Is myopathy related to disorders of internal secretions? *Med. Record*, 1916, lxxxix., June 10, p. 1042.

TIMME, W. Endocrinopathic inheritance. *Journ. Amer. Med. Assoc.*, 1916, lxvi., May 6, p. 1438.

PSYCHIATRY.

GENERAL PARALYSIS—

EVANS, B. D., and THORNE, FRED. H. The treatment of paresis (preliminary report). *Amer. Journ. Insanity*, 1916, lxxii., p. 623.

GENERAL—

FARRANT, RUPERT. The causation and cure of certain lunacies. *Lancet*, 1916, cxc., June 24, p. 1260; *Brit. Med. Journ.*, 1916, June 24, p. 882.

JACOBY, GEORGE W. The curatelle and modern psychiatry. *N. Y. Med. Journ.*, 1916, ciii., June 3, p. 1078 (concluded).

MYERSON, A. Pathological findings in the sympathetic nervous system in the psychoses. *Amer. Journ. Insanity*, 1916, lxxii., p. 591.

SCHEETZ, MILDRED E. The sensibility of the nipple area with reference to mental disease. *Amer. Journ. Insanity*, 1916, lxxii., p. 611.

MACY, MARY S. Public health and the defective. *Med. Record*, 1916, lxxxix., May 27, p. 941.

TREATMENT.

Psychoanalysis.—PUTNAM, JAMES P. The work of Alfred Adler, considered with especial reference to that of Freud. *Psychoanalytic Review*, 1916, iii., April, p. 121.

SHOCKLEY, FRANCIS M. Clinical cases exhibiting unconscious defence reactions. *Psychoanalytic Review*, 1916, iii., April, p. 141.

JELLIFFE, SMITH ELY. Technique of psychoanalysis. *Psychoanalytic Review*, 1916, iii., April, p. 161.

Bibliography

ANATOMY

FULLER, WM. The necessity of revising the nomenclature of the anatomy of the brain. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 29, p. 328.

KOCHER, R. A. The effect of activity on the histologic structure of nerve cells. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 22, p. 278.

HOLMES, GORDON, and LISTER, W. T. Disturbances of vision from cerebral lesions, with special reference to the cortical representation of the macula. *Brain*, 1916, xxxix., June, p. 34; *Proc. Roy. Soc. Med.*, 1916, ix., June (Sect. of Ophthalmol.), p. 57.

AREY, L. B. The influence of light and temperature upon the migration of the retinal pigment of Planorbis trivolvis. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 359 (9 figs.).

RASMUSSEN, A. T., and MYERS, J. A. Absence of chromatolytic change in the central nervous system of the woodchuck (*Marmota monax*) during hibernation. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 391.

KEEGAN, J. J. A study of a Plains Indian brain. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 403.

CHASE, M. R. An experimental study of the vagus nerve. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 421.

AREY, L. B. Changes in the rod-visual cells of the frog due to the action of light. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 429.

DONALDSON, H. H. A preliminary determination of the part played by myelin in reducing the water content of the mammalian nervous system (albino rat). *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 443.

CROZIERS, W. J. The taste of acids. *Journ. Comp. Neurol.*, 1916, xxvi., Aug., p. 453.

PHYSIOLOGY.

BUTLER, E. E. The organic depression of the nerve cell produced by prolonged ether anæsthesia. *Journ. Med. Research*, 1916, xxxiv., p. 325.

BORING, EDWIN G. Cutaneous sensation after nerve division. *Quart. Journ. Exp. Physiol.*, 1916, x., p. 1.

LANGLEY, J. N. Observations on denervated muscle. *Journ. Physiol.*, 1916, l., p. 335.

ADRIAN, E. D. The recovery of conductivity and of excitability in nerve. *Journ. Physiol.*, 1916, l., p. 345.

LANGLEY, J. N. Remarks on the cause and nature of the changes which occur in muscle after nerve section. *Lancet*, 1916, cxci., July 1, p. 6.

MACHT, D. I., JOHNSTON, S. L., and BOLLINGER, H. J. On the peripheral action of the opium alkaloids. Effect on the sensory nerve terminals. *Journ. Pharmacol. and Exp. Therap.*, 1916, viii., Aug., p. 451.

GUNNING, R. E. LEE. Comparative vasomotor reactions in branches of the arterial tree. *Amer. Journ. Physiol.*, 1916, xli., p. 1.

RANSON, S. W., and BILLINGSLEY, P. R. Vasomotor reactions from stimulations of the floor of the fourth ventricle.—III. Studies in vasomotor reflex arcs. *Amer. Journ. Physiol.*, 1916, xli., p. 85.

BURTON-OPITZ, R., and EDWARDS, D. J. The nature of the splanchnic rise in blood-pressure. *Amer. Journ. Physiol.*, 1916, xli., p. 91.

BURTON-OPITZ, R. Depressor action of the thoracic sympathetic nerve and its branches. *Amer. Journ. Physiol.*, 1916, xli., p. 103.

CANNON, W. B., and CATTELL, M'KEEN. Studies on the conditions of activity in endocrine glands.—I. The electrical response as an index of glandular action. *Amer. Journ. Physiol.*, 1916, xli., p. 39. II. The secretory innervation of the thyroid gland, *ibid.*, p. 58. III. The influence of the adrenal secretion on the thyroid, *ibid.*, p. 74.

MANN, FRANK C. The ductless glands and hibernation. *Amer. Journ. Physiol.*, 1916, xli., p. 173.

McLEAN, JAY. The thromboplastic action of cephalin. *Amer. Journ. Physiol.*, 1916, xli., p. 250.

PSYCHOLOGY.

SCHINZ, A. The renewal of French thought on the eve of the War. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 297.

BORING, E. G. The number of observations upon which a limen may be based. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 315.

GEORGE, S. S. The gesture of affirmation among the Arabs. *Amer. Journ. Psychol.*, 1916, xxvii , July, p. 320.

SWINDLE, P. F. Positive after-images of long duration. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 324.

FERREE, C. E., and RAND, S. A simple daylight photometer. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 335.

STRONG, M. H., and STRONG, E. K., Jr. The nature of recognition memory and of the localisation of recognitions. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 341.

DOOLEY, L. Psycho-analytic study of genius. *Amer. Journ. Psychol.*, 1916, xxvii., July, p. 363.

PRINCE, W. F. The Doris case of quintuple personality. *Journ. Abnorm. Psychol.*, 1916, xi., June-July, p. 73.

WILSON J. G. Abnormal mental states in children during convalescence from acute illness, with a report of a case. *Journ. Abnorm. Psychol.*, 1916, xi., June-July, p. 123.

MACLEOD, KENNETH. Dreaming. *Caledonian Med. Journ.*, 1916, x., July, p. 246; *Med. Press*, 1916, *n.s.*, cii., Aug. 2, p. 98.

SCHMITT, CLARA. The co-operation of psychologist and physician. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., July, p. 34.

PATHOLOGY.

BIONDI, GIOSUÈ. Studi sulla ghiandola pineale. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Giugno and Luglio, pp. 251 and 269.

ORR, DAVID, and ROWS, R. G. Toxi-infection of the central nervous system: a clinical and experimental investigation. *Edin. Med. Journ.*, 1916, xvii., Aug., p. 78.

LEVENE, P. A., and WEST, C. J. Cerebronic acid.—V. Relation of cerebronic and lignoceric acids. *Journ. Biol. Chem.*, 1916, xxvi., Aug., p. 115.

ROSENHEIM, M. C. A new colour reaction for "oxycholesterol." *Biochem. Journ.*, 1916, x., June, p. 176.

CLINICAL NEUROLOGY.

GENERAL—

ASTWAZATUROF, M. Babinski's sign from the point of view of comparative anatomy. *Brit. Med. Journ.*, 1916, Aug. 12, p. 219.

KEYSER, T. S. Hoffmann's sign or the "digital reflex." *Journ. Nerv. and Ment. Dis.*, 1916, xliv., July, p. 51.

MOLEEN, GEORGE A. The nervous system as influenced by high altitudes. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 12, p. 477.

RHEIN, J. H. W. Family spastic paralysis. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Aug., p. 115.

MUSCLES—

REGNAULT, J. La traction élastique continue et progressive au moyen d'appareils simples, dans le traitement des raideurs articulaires et des rétractions musculo-tendineuses. *Prog. Med.*, 1916, Juillet 20, p. 123.

NERVES—

PLATT, H. The treatment of nerve injuries of warfare. *Clin. Journ.*, 1916, xlv., Aug. 9, p. 285.

PITRES, A. La valeur des signes cliniques permettant de reconnaître dans les blessures des nerfs périphériques: A, La section complète d'un nerf. Sa restauration fonctionnelle. (Discussion.) *Rev. Neurol.*, 1916, xxiii., Avril-Mai, p. 477.

ROBERTS, F. Shrapnel wound involving the brachial plexus, together with the vagus, spinal accessory, and phrenic nerves of the same side. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Aug., p. 248.

EVANS, J. J. Three cases of paralysis of the cervical sympathetic. *Birmingham Med. Review*, 1916, lxxx., July 15, p. 7.

ADRIAN, E. D. The electrical reactions of muscles before and after nerve injury. *Brain*, 1916, xxxix., June, p. 1.

BURKE, N. H. M. The reaction of degeneration in medical literature. *Archives of Radiol. and Electrotter.*, 1916, xxi., July, p. 54.

SPINAL CORD—

General.—THOMPSON, G. W., and STANLEY, G. W. Gunshot wound of spinal cord and trachea: recovery. *Brit. Med. Journ.*, 1916, July 15, p. 74.

ELSBERG, CHARLES A. Some technical features of laminectomy for spinal disease and injury, based on one hundred and fifty spinal operations. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 15, p. 168.

BURY, JUDSON S. Note on the distant effects of rifle bullets; with special reference to the spinal cord. *Brit. Med. Journ.*, 1916, Aug. 12, p. 212.

Tumour.—DERCUM, F. X., and COSTA, J. C. DA. Intramedullary tumour of cervical cord. Diagnosis. Removal in two-stage operation: gradual improvement. *Journ. Nerv. and Ment. Dis.*, 1911, xliv., Aug., p. 97.

Poliomyelitis Anterior Acuta.—BATTEN, F. E. Acute poliomyelitis. *Brain*, 1916, xxxix., June, p. 115.

FRASER, FRANCIS R. Epidemic poliomyelitis. The symptomatology and diagnosis in the acute stages. *Boston Med. and Surg. Journ.*, 1916, clxxv., July 20, p. 83.

STERN, WALTER G. The prognosis in infantile paralysis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 29, p. 325.

WHITTEMORE, W. S. STEWART. A suggestion as to the prevention of infantile paralysis. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 17, p. 231.

FLEXNER, SIMON. The nature, manner of conveyance, and means of prevention of infantile paralysis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 22, p. 279.

ROBBINS, F. The control of the next epidemic of infantile paralysis. *Med. Record*, 1916, xc., Aug. 19, p. 328.

SHEFFIELD, HERMAN B. Epidemic poliomyelitis. Preliminary report of 33 cases. *Med. Record*, 1916, xc., Aug. 19, p. 330.

FISCHER, LOUIS. A note on poliomyelitis, with its preparalytic symptom. *Med. Record*, 1916, xc., July 29, p. 194.

SMITH, J. GARDNER. A fatal case of poliomyelitis in an adult. *Med. Record*, 1916, xc., Aug. 26, p. 373.

BARBER, W. L. The diagnosis and treatment of poliomyelitis. *Med. Record*, 1916, xc., July 22, p. 142.

NEUSTAEDTER, M. N. The diagnosis and treatment of acute anterior poliomyelitis in the preparalytic and postparalytic stages. *N. Y. Med. Journ.*, 1916, civ., July 22, p. 145.

MELTZER, S. J. The treatment of acute poliomyelitis. *N. Y. Med. Journ.*, 1916, civ., Aug. 19, p. 337.

DUNCAN, C. H. Autotherapy in poliomyelitis. *N. Y. Med. Journ.*, 1916, civ., Aug. 19, p. 342.

SCHALLER, W. F. Treatment of paralysis following acute anterior poliomyelitis. *Archives of Ped.*, 1916, xxxiii., July, p. 516.

LOVETT, ROBERT W. A plan of treatment in infantile paralysis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 5, p. 421.

SOPHIAN, ABRAHAM. Specific treatment of infantile paralysis: preliminary note. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 5, p. 426.

FLEXNER, SIMON. A note on the serum treatment of poliomyelitis (infantile paralysis). *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 19, p. 583.

SHARPE, NORMAN. Intradural nerve anastomosis in selected cases of poliomyelitic paralysis. *N. Y. Med. Journ.*, 1916, civ., July 1, p. 14 (1 illust.).

TALMEY, MAX. Reflections on predisposing factors in infantile paralysis. *N. Y. Med. Journ.*, 1916, civ., July 29, p. 202.

KLEIN, S. R. Laboratory facts in poliomyelitis. *N. Y. Med. Journ.*, 1916, civ., July 29, p. 219.

NEAL, J. B. Laboratory aids in the diagnosis of poliomyelitis. *N. Y. Med. Journ.*, 1916, civ., July 22, p. 167.

HERNAMAN-JOHNSON, FRANCIS. A note on the necessity for prolonged treatment in cases of infantile paralysis. *Lancet*, 1916, cxci., July 29, p. 185 (illust.).

Spondylitis.—CAMPBELL, WILLIS C. Localised osteospondylitis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 19, p. 572.

BRAIN—

General.—STEWART, PURVES, and GRIFFITH, A. D. A case of oblique hemianopia from wound of optic chiasma. *Lancet*, 1916, cxci., July 15, p. 104 (illust.).

Skull injury, &c.—MATTHEWS, SIDNEY. Extraction of intracranial foreign bodies. *Brit. Med. Journ.*, 1916, July 15, p. 76.

ADDINSELL, A. W. Head injuries in war. *Brit. Med. Journ.*, 1916, July 22, p. 99.

MARIE, PIERRE. La conduite à tenir vis-à-vis des blessures du crane. (Discussion.) *Rev. Neurol.*, 1916, xxiii., Avril-Mai, p. 452.

L'opération primitive des blessés du crâne. Doit-on toujours la pratiquer?—Quels sont les types d'opérations; où faut-il s'arrêter?—Les esquilles de la table interne doivent-elles toujours être admises et recherchées, lors de simple fissure de la table externe?—Le lambeau est-il préférable à l'incision cruciale? Quels sont les indications, la technique et les résultats de l'extraction primitive des projectiles intra-cérébraux? *Rev. Neurol.*, 1916, xxiii., Juin, p. 721.

L'évacuation des blessés du crâne. *Rev. Neurol.*, 1916, xxiii., Juin, p. 777.

Les accidents secondaires précoces, à la suite des plaies du crâne, en particulier les hernies du cerveau, les abcès, les accidents méningitiques, les épilepsies globales ou partielles: quels sont leur fréquence, leur pronostic et leur traitement? L'extraction secondaire des projectiles. *Rev. Neurol.*, 1916, xxiii., Juin, p. 791.

A quels accidents tardifs (troubles moteurs, troubles de la parole, troubles visuels, troubles subjectifs) sont exposés les blessés du crâne, guéris de leur blessure, et pendant combien de temps? Que penser de leur aptitude militaire? *Rev. Neurol.*, 1916, xxiii., Juin, p. 821.

La cranioplastie: indications, techniques, suites opératoires et suites éloignées.—Est-il légitime de réduire l'indemnisation d'un blessé, qui se refuse à cette intervention? *Rev. Neurol.*, 1916, xxiii., Juin, p. 839.

La valeur protectrice du casque. *Rev. Neurol.*, 1916, xxiii., Juin, p. 857.

Cerebral Arterio-Sclerosis.—HOCH, AUGUST. The dementia of the cerebral arteriosclerosis. *Psychiatric Bulletin*, 1916, ix., July, p. 306.

Progressive Muscular Atrophy.—BLISS, M. A. Werding-Hoffmann early infantile progressive spinal muscular atrophy. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Aug., p. 108.

Meningitis.—RAMOND, F. Méningite cérébro-spinale prolongée et méningo-épendymite, nécessitant la trépano-ponction. *Prog. Méd.*, 1916, Juin 20, p. 95.

RAMOND, F. A propos du traitement de la méningite cérébro-spinale méningococcique. *Prog. Med.*, 1916, Juillet 5, p. 105.

ETIENNE, G., and GROSJEAN, A. Méningite cérébro-spinale et septicémie staphylococciques. *Prog. Med.*, 1916, Août 5, p. 129.

CHEYNE, W. H. W. Notes on the treatment of cerebro-spinal fever. *Journ. Royal Naval Med. Service*, 1916, ii., July, p. 325.

GAMBLE, M. F. H. A contribution to the etiology of epidemic cerebro-spinal meningitis. *Lancet*, 1916, cxci., Aug. 12, p. 277.

FITZGERALD, J. G. Meningococcus meningitis. *Canadian Med. Assoc. Journ.*, 1916, vi., Aug., p. 695.

HUNTINGTON, W. H. Case of mastoiditis complicated by purulent cerebro-spinal meningitis; operation and recovery. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 15, p. 201.

GORDON, M. H. Disinfection of the naso-pharynx of meningococcus-carriers by means of air saturated with a solution of disinfectant. *Brit. Med. Journ.*, 1916, July 1, p. 8.

LLOYD, D. J. On the importance of technical details in the preparation of a transparent blood-agar for the cultivation of the meningococcus. *Brit. Med. Journ.*, 1916, July 29, p. 143.

WATSON-WILLIAMS, P. Note on the technique of sphenoidal sinus exploration for meningococcal and other infections. *Bristol Med.-Chir. Journ.*, 1916, xxxiv., July, p. 21.

KOPLIK, HENRY. Meningitis in the new-born and in infants under three months of age. *Archives of Ped.*, 1916, xxxiii., July, p. 481.

WALKER, E. H. Two cases of tuberculous meningitis occurring simultaneously in a family. *Brit. Med. Journ.*, 1916, Aug. 12, p. 221.

AUSTRIAN, CHARLES R. Experimental tuberculous meningitis. *Bull. Johns Hopkins Hosp.*, 1916, xxvii., Aug., p. 237.

Embolism.—GAUSS, HARRY. Studies in cerebral fat embolism. With reference to the pathology of delirium and coma. *Archives Int. Med.*, 1916, xviii., July, p. 76.

Hemiplegia.—ELLIOTT, GEORGE R., and BOORSTEIN, SAMUEL W. Orthopedic treatment in hemiplegics of long standing. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 1, p. 31.

BARLOW, F. A few notes on paralytic stroke. *Med. Press*, 1916, *n.s.*, cii., July 12, p. 35.

Tumour.—CADWALADER, WM. B. On the symptomatology and diagnosis of intracranial tumours of the middle and posterior cranial cavities, growing from the region of the Gasserian ganglion and the cerebello-pontine angle. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., July, p. 11.

HEUER, GEORGE J., and DANDY, WALTER E. A report of seventy cases of brain tumour. *Bull. Johns Hopkins Hosp.*, 1916, xxvii., Aug., p. 224 (illust.).

ELLETT, E. C. A primary intradural tumor of the optic nerve: removal with preservation of the ball. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 8, p. 104.

POCKLEY, F. ANTILL. A second case of intra-orbital growth removed by Krönlein's operation (osteoplastic resection of outer wall of orbit). *Med. Journ. Australia*, 1916, ii., July 1, p. 5.

FORTUNET, DE, and CADE, A. Sur un cas de cancer gastrique avec noyau secondaire cérébelleux et accidents méningitiques terminaux. *Prog. Méd.*, 1916, Août 5, p. 132.

SMITH, S. Notes on the treatment of hernia cerebri. *Brit. Med. Journ.*, 1916, July 22, p. 102 (illust.).

Infantilism.—EVANS, J. J. Pathological report on a case of pituitary infantilism. *Birmingham Med. Review*, 1916, lxxx., July 15, p. 1.

Diabetes Insipidus.—ROSENBLOOM, J., and PRICE, H. T. A metabolism study of a case of diabetes insipidus. *Amer. Journ Dis. Child.*, 1916, xii., July, p. 53.

Progressive Lenticular Degeneration.—ROSSI, ENRICO. Un caso di "Malattia del Wilson." Contributo clinico. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Giugno, p. 225.

BRAMWELL, B. Clinical studies.—X. Familial cirrhosis of the liver: four cases of acute fatal cirrhosis of the liver in the same family. Suggested relationship to Wilson's progressive degeneration of the lenticular nucleus. *Edin. Med. Journ.*, 1916, xvii., Aug., p. 90.

Brain Sclerosis.—KRABBE, KNUD. A new familial, infantile form of diffuse brain sclerosis. *Brain*, 1916, xxxix., June, p. 74.

Paralysis Agitans.—POLLOCK, L. J. The cause of the allorhythmic type of tremor in paralysis agitans. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Aug., p. 104.

BERKELEY, WM. N. The treatment of paralysis agitans with parathyroid gland. *Med. Record*, 1916, Aug. 26, p. 105.

DANZER, SAUL. The treatment of paralysis agitans and arthritis deformans by the continuous bath. *Med. Record*, 1916, xc., Aug. 26, p. 367.

Pellagra.—SILER, J. F., GARRISON, P. E., and MACNEAL, W. J. Introduction to the third report of the Robert M. Thompson Pellagra Commission of the New York Post-Graduate Medical School and Hospital. *Archives Int. Med.*, 1916, xviii., July, p. 1.

SILER, J. F., GARRISON, P. E., and MACNEAL, W. J. The incidence of pellagra in Spartanburg County, South Carolina, and the relation of the initial attack to race, sex, and age. *Archives Inter. Med.*, 1916, xviii., Aug., p. 173.

MUNCEY, E. B. A study of the heredity of pellagra in Spartanburg County, South Carolina. *Archives of Int. Med.*, 1916, xviii., July, p. 32.

VEDDER, F. B. Dietary deficiency as the etiological factor in pellagra. *Archives of Int. Med.*, 1916, xviii., Aug., p. 137.

CALVERT, J. T. A case of pellagra. *Indian Med. Gaz.*, 1916, li., July, p. 241.

AULDE, JOHN. Pellagra: a critical study. *Med. Record*, 1916, xc., July 29, p. 181.

Beri-Beri.—WILLCOX, W. H. Beri-beri—with special reference to prophylaxis and treatment. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Aug., p. 191.

M'DONALD, W. H. The beri-beri puzzle. A suggested solution. *Journ. Trop. Med. and Hygiene*, 1916, xix., Aug. 1, p. 177.

FLEMING, ROBERT A., and GIBSON, H. J. C. Three cases of beri-beri. *Edin. Med. Journ.*, 1916, xvii., July, p. 27.

SHIE, MARVIN D. The effect of vitamines on body growth. *Med. Press*, 1916, *n.s.*, cii., Aug. 23, p. 167.

Sclerodermia.—COCKAYNE, E. A. Congenital and acquired sclerodermia in childhood. *Brit. Journ. Child. Dis.*, 1916, xiii., Aug., p. 225.

Syphilis.—HAMMES, F. M. A case of cerebro-spinal syphilis associated with pneumococcic meningitis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 29, p. 357.

BONDURANT, E. D. Syphilis of the nervous system. *N.Y. Med. Journ.*, 1916, civ., July 15, p. 97.

FRENCH, HERBERT. Syphilis of the cardio-vascular system. *Clin. Journ.*, 1916, xlv., Aug. 23, 30, Sept. 6, pp. 305, 313, and 325.

FRASER, J. S. Syphilitic diseases of the ear. (A résumé of recent literature.) *Edin. Med. Journ.*, 1916, xvii., July, p. 5.

M'CASKEY, G. W. Syphilitic aortic disease. *N.Y. Med. Journ.*, 1915, civ., July 8, p. 60 (3 illust.).

WESTROPE, L L. Syphilis: two early cases of reinfection after treatment with salvarsan and mercurial inunctions. *Brit. Med. Journ.*, 1916, July 22, p. 109.

M'DONAGH, J. E. R. A new test for syphilis (the emulsion-gelation, or the "gel" test). *Brit. Journ. Dermatol.*, 1916, xxviii., p. 114.

Neosalvarsan, &c.—DUDLEY, S. F. Galyl and neosalvarsan. *Journ. Royal Naval Med. Service*, 1916, ii., July, p. 289.

DUDLEY, S. F. An experience of galyl at Royal Naval Hospital, Chatham. *Lancet*, 1916, cxci., July 8, p. 59 (1 illust.).

LIKES, S. H., and SCHOENRICH, H. Syncope immediately after the administration of diarsenol. *N.Y. Med. Journ.*, 1916, civ., July 8, p. 64.

Wassermann Reaction.—BASSETT-SMITH, P. W. The complement deviation test (Wassermann's reaction) for syphilis, and some comments on irregularities noticed in practical experience. *Journ. Royal Naval Med. Service*, 1916, ii., July, p. 282.

BROWN, H. C., and IYENGAR, K. R. K. Fallacies of certain modifications of the Wassermann reaction due to variation in complement content. *Indian Journ. Med. Research*, 1916, iv., July, p. 41.

STEPHENS, H. F. The compluetic reaction (Wassermann) in amentia: an original study of 100 cases. *Proc. Roy. Soc. Med.*, 1916, ix., June (Sect. of Psychiat.), p. 27.

SNOW, C. G., and COOPER, A. T. The Wassermann reaction in its relation to tuberculosis. *Amer. Journ. Med. Sci.*, 1916, clii., Aug., p. 185.

BUCK, JOHN M. A multiple pipet for the complement-fixation test. *Journ. Infect. Dis.*, 1916, xix., Aug., p. 267.

FALLS, F. H., and MOORE, J. J. The value of the Wassermann test in pregnancy. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 19, p. 574.

LEMCHEN, B. The Wassermann reaction. *Med. Record*, 1916, xc., July 15, p. 107.

Cerebro-Spinal Fluid.—JOHNSTON, M. R. A study of normal and pathologic cerebro-spinal fluids in children. *Amer. Journ. Dis. Child.*, 1916, xii., Aug., p. 112.

HANES, F. M. The spinal fluid syndromes of Nonne and Froin and their diagnostic significance. *Amer. Journ. Med. Sci.*, 1916, cli., Aug., p. 66.

RAMSAY, G. A., and FIDLAR, E. The colloidal gold test in cerebro-spinal fluids. *Canadian Med. Assoc. Journ.*, 1916, vi., Aug., p. 685.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—DERCUM, FRANCIS X. Epilepsy, with special reference to treatment. *Journ. Amer. Med. Assoc.*, 1916, lxvii , July 22, p. 247.

MACCURDY, JOHN T. Epileptic dementia. *Psychiatric Bulletin*, 1916, ix., July, p. 341.

Hysteria.—DESOGUS, V. Dermatosi simulata in un'isterica. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Agosto, p. 427.

Chorea.—MORSE, J. L., and FLOYD, C. A study of the etiology of chorea. *Amer. Journ. Dis. Child.*, 1916, xii., July, p. 61.

HEIMAN, HENRY. The effect of subcutaneous injections of magnesium sulphate in chorea. *Amer. Journ. Dis. Child.*, 1916, xii., Aug., p. 109.

KING, CLARENCE. Hereditary chorea. *N.Y. Med. Journ.*, 1916, civ., Aug. 12, p. 306.

Alcoholism.—KIRBY, GEORGE H. Alcoholic hallucinosis, with special reference to prognosis and relation to other psychoses. *Psychiatric Bulletin*, 1916, ix., July, p. 353.

HARE, FRANCIS. The causation and treatment of delirium tremens. *Clin. Journ.*, 1916, xlv., Aug. 16, p. 293.

LEONARD, EDWARD A. Intraspinal injections of magnesium sulphate in delirium tremens. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 12, p. 509.

SPEARS, L. P. Delirium tremens and drug habitues in public institution practice. *Therap. Gaz.*, 1916, xl., Aug., p. 551.

Drug Addictions.—M'GUIRE, FRANK A., and LICHTENSTEIN, PERRY M. The drug habit. *Med. Record*, 1916, xc., Aug. 5, p. 185.

CROTHERS, T. D. Drug addicts and their treatment. *Med. Record*, 1916, xc., Aug. 5, p. 238.

Neurasthenia.—HOWLAND, G. W. The passing of "neurasthenia." *Clin. Journ.*, 1916, xlv., Aug. 16, p. 301.

KING, C. Hypochondria. *Med. Record*, 1916, xc., July 29, p. 195.

Neuroses.—PASHAYAN, N. A. A clinical study of so-called cardiac neurosis. *Albany Med. Annals*, 1916, xxxvii., Aug., p. 357.

GOODALE, J. L. The diagnosis and management of vasomotor disturbances of the upper air passages. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 10, p. 181.

OBERNDORF, C. P. An analysis of certain neurotic symptoms. *N.Y. Med. Journ.*, 1916, civ., July 22, p. 151.

"Shell Shock."—VERGER, H. La notion de consolidation dans les névroses traumatiques des sinistrés du travail et des blessés de guerre. *Prog. Med.*, 1916, Juillet 20, p. 118.

VINCENT, M. Cl. Sur les accidents nerveux déterminés par la déflagration des fortes charges d'explosifs. *Rev. Neurol.*, 1916, xxiii., Avril-Mai, p. 573.

BABINSKI, M. J. Les caractères des troubles moteurs (paralysies, contractures, &c.) dits fonctionnels et la conduite à tenir à leur égard. *Rev. Neurol.*, 1916, xxiii., Avril-Mai, p. 521.

PASTINE, C. Commozione dei centri nervosi da explosione violenta a breve distanza. (Influenza del dolore fisico sullo stato psichico.) *Riv. di Patol. nerv. e ment.*, 1916, xxi., Agosto, p. 433.

LISI, L. de. L'influenza degli avvelenamenti da caffè e da "Veronal" sulla funzione spermatogenetica di animali normali e di animali sottoposti a commozione cerebrale. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Agosto, p. 401.

MILLIGAN, E. T. C. A method of treatment of "shell shock." *Brit. Med. Journ.*, 1916, July 15, p. 73.

CLARKE, J. MICHELL. Some neuroses of the War. *Bristol Med.-Chir. Journ.*, 1916, xxxiv., July, p. 49.

EDER, M. D. An address on the psycho-pathology of the war neuroses (delivered at the Malta Medical Conference on 9th April 1916). *Lancet*, 1916, cxci., Aug. 12, p. 264.

BARKER, LEWELLYS F. War and the nervous system. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., July, p. 1.

Neuritis.—CARLILL, HILDRED. On the gluteal fold in sciatic neuritis. *Lancet*, 1916, cxci., Aug. 19, p. 323.

Exophthalmic Goitre, Cretinism, &c.—AIKINS, W. H. B. Exophthalmic goitre. *N. Y. Med. Journ.*, 1916, civ., July 8, p. 49.

JUDD, E. S., and PEMBERTON, J. D. Results of operations for exophthalmic goitre. *Med. Press*, 1916, *n.s.*, cii., Aug. 9, p. 125.

BECK, H. S. Hypothyroidism with report of cases. *Therap. Gaz.*, 1916, xl., Aug., p. 533.

WILSON, L. B., and DURANTE, L. Changes in the superior cervical sympathetic ganglia removed for the relief of exophthalmos. *Journ. Med. Research*, 1916, xxxiv., July, p. 273.

M'CARRISON, ROBERT. On the experimental production of congenital goitre. *Proc. Roy. Soc.*, 1916, Series B, lxxxix., p. 322.

MACKAY, N. D. The influence of certain factors on the incidence of endemic goitre. *Caledonian Med. Journ.*, 1916, x., July, p. 254.

SHARP, J. G. Atrophy of the thyroid gland with hypertrophy of the pituitary gland. *Clin. Journ.*, 1916, xlv., Aug. 9, p. 290.

COBB, IVO GEIKIE. Thyroid deficiency. *Med. Press*, 1916, *n.s.*, cii., July 5 and 12, pp. 9 and 20.

TALBOT, F. B. The energy metabolism of a cretin. *Amer. Journ. Dis. Child.*, 1916, xii., Aug., p. 145.

Raynaud's Disease.—YAWGER, N. S. Frost bite in the hand resembling Raynaud's disease. *N. Y. Med. Journ.*, 1916, civ., Aug. 26, p. 406.

Tetanus.—ROBERTSON, H. E. Distribution of tetanus toxin in the body. *Amer. Journ. Med. Sci.*, 1916, cliii., Aug., p. 31.

STRATON, A. A. Severe tetanoid spasm limited to the wounded limb. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Aug., p. 212.

Tetany.—HOLMES, J. B. The reliability of the electrical diagnosis of tetany, with especial consideration of the electrical values found in normal children. *Amer. Journ. Dis. Child.*, 1916, xii., July, p. 1.

MISCELLANEOUS SYMPTOMS AND CASES—

COLLIE, Sir JOHN. Miner's nystagmus and malingering. *Caledonian Med. Journ.*, 1916, x., July, p. 263.

NICE, C. M. Report of a case of adiposis dolorosa. *Med. Record*, 1916, xc., July 8, p. 65.

BURR, CHARLES W. Two cases of cannalis indica intoxication. *Therap. Gaz.*, 1916, xl., Aug., p. 554.

OBERNDORF, C. P. Simple tic mechanism. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 8, p. 99.

WEBER, F. PARKES, and STEBBING, G. F. A case of ateleiosis. *Brit. Journ. Child. Dis.*, 1916, xiii., July, p. 200.

MANLEY, O. T., and MARINE, DAVID. The transplantation of ductless glands, with reference to permanence and function. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 22, p. 260.

COBB, IVO GEIKIE. The pituitary body. *Med. Press*, 1916, *n.s.*, cii., Aug. 16, p. 145.

COBB, IVO GEIKIE. The adrenal glands. *Med. Press*, 1916, *n.s.*, cii., Aug. 30, p. 186.

SPECIAL SENSES AND CRANIAL NERVES—

DECKER, JOHN J. Some eye symptoms of diagnostic value. *N.Y. Med. Journ.*, 1916, civ., Aug. 5, p. 262.

SLOCUM, GEORGE. A study of ophthalmoscopic changes in nephritis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 1, p. 5.

BROWN, E. J. Sudden blindness associated with choked disc and nasal sinus disease. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 1, p. 34.

WALTER, WILL. The etiology of nonparalytic ocular imbalance: some original conceptions and interpretations based on the physiology and psychology of ocular movements. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 15, p. 193.

HOWE, LUCIEN. The fatigue of accommodation as registered by the ergograph. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 8, p. 100.

ZENTMAYER, WM. Traumatic pulsating exophthalmos. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 15, p. 163.

FISHER, L., and JONES, I. H. Vertigo and sea-sickness. *N.Y. Med. Journ.*, 1916, civ., July 15, p. 99.

ROBERTSON, W. N. Notes on headache from the oto-rhinologist's point of view. *Med. Journ. Australia*, 1916, ii., July 15, p. 38.

PSYCHIATRY.

GENERAL PARALYSIS—

ORTON, S. T. Some considerations of general paresis from the histological standpoint. *Amer. Journ. Insanity*, 1916, lxxiii., July, p. 89.

DRYSDALE, H. H. Conjugal paresis: report of a case. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 29, p. 340.

CAMPBELL, C. MACFIE. The nature of the dementia in dementia paralytica. *Psychiatric Bulletin*, 1916, ix., July, p. 316.

DEMENTIA PRÆCOX—

KARPAS, MORRIS J. Dementia præcox. *N.Y. Med. Journ.*, 1916, civ., July 1, p. 18.

DERCUM, FRANCIS X. The story of dementia præcox. *N.Y. Med. Journ.*, 1916, civ., Aug. 12, p. 289.

FARRAR, CLARENCE B. Some factors in schizophrenic dementia. *Psychiatric Bulletin*, 1916, ix., July, p. 323.

GENERAL—

HARAN, J. A. A note of a case of cataleptic trance. *Journ. Trop. Med. and Hygiene*, 1916, xix., Aug. 15, p. 189.

HENDERSON, DAVID K. Catatonia as a type of mental reaction. *Journ. Ment. Sci.*, 1916, lxii., July, p. 556.

STRECKER, E. A. An evaluation of paraphrenia. *N.Y. Med. Journ.*, 1916, civ., Aug. 19 and 26, pp. 344 and 399.

MERCIER, CHAS. Diet as a factor in the causation of mental disease. *Journ. Ment. Sci.*, 1916, lxii., July, p. 505.

LUGARO, E. La psichiatria tedesca nella storia e nell' attualità.—III. (contd.). *Riv. di Patol. nerv. e ment.*, 1916, xxi., Luglio, p. 337.

NELSON, BURT E. Chemical studies on the central nervous system. *Psychiatric Bulletin*, 1916, ix., July, p. 368.

DUNN, W. SHAW. Pseudologia phantastica, or pathological lying, in a case of hysteria with moral defect. *Journ. Ment. Sci.*, 1916, lxii., July, p. 595.

RAYNER, HENRY. A serious defect in some of the registered hospitals for the insane. *Lancet*, cxci., July 29, p. 196.

ADAMS, J. BARFIELD. Zola's study of heredity. *Journ. Ment. Sci.*, 1916, lxii., July, p. 530.

REDFIELD, CASPER L. Extracts from an address delivered 12th April 1916, before the Zoological Department of the University of Chicago. *Journ. Ment. Sci.*, 1916, lxii., July, p. 573.

BRUSH, EDWARD N. Our work as psychiatrists, and its opportunities. (Presidential address.) *Journ. Ment. Sci.*, 1916, lxii., July, p. 578.

CROFT, B. P. Hygiene of the mind. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 24, p. 251.

PUTNAM, JAMES J. Mental preparedness. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 24, p. 260.

WHITE, WM. A. The meaning of the mental hygiene movement. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 24, p. 264.

GODDARD, HENRY H. The menace of mental deficiency from the standpoint of heredity. *Boston Med. and Surg. Journ.*, 1916, clxxv., Aug. 24, p. 269.

DONKIN, SIR BRYAN. Occasional notes on the Mental Deficiency Act. *Journ. Ment. Sci.*, 1916, lxii., July, p. 469.

MEYER, ADOLF. The scope of psychopathology. *Psychiatric Bulletin*, 1916, ix., July, p. 297.

BRONNER, A. F. What do psychiatrists mean? *Journ. Nerv. and Ment. Dis.*, 1916, xliv., July, p. 30.

BRUSH, E. N. Presidential address—"Our work as psychiatrists and its opportunities." *Amer. Journ. Insanity*, 1916, lxxiii., July, p. 1.

BUTLER, P. Annual address—"Stage-mad folk in Shakespeare's day." *Amer. Journ. Insanity*, 1916, lxxiii., July, p. 19.

ROSANOFF, A. J. Intellectual efficiency in relation to insanity. *Amer. Journ. Insanity*, 1916, lxxiii., July, p. 43.

COPP, OWEN. The psychiatric needs of a large community. *Amer. Journ. Insanity*, 1916, lxxiii., July, p. 79.

TREATMENT.*

CLAYTON, E. BELLIS. Some of the uses and abuses of massage. *Lancet*, 1916, cxci., July 8, p. 58.

JELLIFFE, SMITH ELY. The physician and psychotherapy. *Med. Record*, 1916, xc., Aug. 26, p. 362.

PATRICK, HUGH T. The factor of fear in nervous cases. *Journ. Amer. Med. Assoc.*, 1916, lxvii., July 15, p. 180.

MAYLARD, A. E. The influence of the mind upon the body in patients undergoing surgical operations. *Clin. Journ.*, 1916, xlv., July 26, p. 269.

* A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Bibliography

ANATOMY.

AREY, LESLIE B. The function of the efferent fibres of the optic nerve of fishes. *Journ. Comp. Neurol.*, 1916, xxvi., p. 213 (2 plates).

COGHILL, G. E. Correlated anatomical and physiological studies of the growth of the nervous system of amphibia.—II. The afferent system of the head of Amblystoma. *Journ. Comp. Neurol.*, 1916, xxvi., p. 247 (79 figs.).

KOCHER, R. A. The effect of activity on the histological structure of nerve cells. *Journ. Comp. Neurol.*, 1916, xxvi., p. 341.

PHYSIOLOGY.

FISHER, HOMER G., and MULLER, HENRY R. Unilateral destruction of the semicircular canals in cats. *Amer. Journ. Physiol.*, 1916, xli., p. 267.

BOURGUIGNON, G. Mesures de résistance par les décharges de condensateurs, au moyen d'un milliampèremètre sensible, employé comme galvanomètre balistique. (Recherches préliminaires à l'étude d'un procédé determination de la chronaxie chez l'homme.) *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 584; Procédé de détermination de la chronaxie chez l'homme à l'aide des décharges de condensateurs. Technique. *Ibid.*, 1916, lxxix., p. 637; Determination de la chronaxie chez l'homme à l'aide des décharges de condensateurs. Chronaxie normale des nerfs et muscles du membre supérieur de l'homme. *Ibid.*, 1916, lxxix., p. 641.

GOODMAN, C. The transplantation of the thyroid gland in dogs. *Amer. Journ. Med. Sci.*, 1916, cliii., Sept., p. 348.

PSYCHOLOGY.

REANEY, MABEL JANE. The psychology of the organised group game. *Brit. Journ. Psychol.* (Monograph supplements, IV.), 1916.

THOMSON, G. H. A hierarchy without a general factor. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 271.

SPEARMAN, C. Some comments on Mr Thomson's paper. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 282.

READ, CARVETH. The relations between magic and animism. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 285.

SMITH, W. G. The prevalence of spatial contrast in visual perception. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 317.

SMITH, MAY. A contribution to the study of fatigue. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 327.

MUSCIO, B. The influence of the form of a question. *Brit. Journ. Psychol.*, 1916, viii., Sept., p. 351.

HUDSON-MAKUEN, G. The psychology of diseases of the respiratory tract. *N.Y. Med. Journ.*, 1916, civ., Sept. 23, p. 577.

SHAW, T. CLAYE. The German Emperor's fanaticism. *Med. Press*, 1916, cliii., Sept. 6, p. 210.

HORTON, L. H. On the irrelevancy of dreams. *Journ. Abnorm. Psychol.*, 1916, xi., Aug.-Sept., p. 143.

PUTNAM, J. J. On the utilisation of psychoanalytic principles in the study. *Journ. Abnorm. Psychol.*, 1916, xi., Aug.-Sept., p. 172.

BURROW, T. Permutations within the sphere of consciousness. *Journ. Abnorm. Psychol.*, 1916, xi., Aug.-Sept., p. 178.

SOUTHARD, E. E. On descriptive analysis of manifest delusions from the subject's point of view. *Journ. Abnorm. Psychol.*, 1916, xi., Aug.-Sept., p. 189.

PATHOLOGY.

BIONDI, GIOSUÈ. Studi sulla ghiandola pineale.—III. I fenomeni secretori ed i lipoidi. I risultati della colorazione vitale alla Goldmann. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1915, ix., Agosto, p. 303.

D'ABUNDO, G. Sopra alcune particolari manifestazioni compensative nei nuclei opto-striati. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Sett., p. 343.

ZUNZ, E., and MOHILEVITCH, C. Des effets de l'injection intraveineuse de sérum traité par la pararabine chez les lapins neufs. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 601.

QUINAN, CLARENCE. Lipase studies.—IV. On regional lipolytic activity in the normal human brain. *Journ. Med. Research*, 1916, xxxv., Sept., p. 79.

WINSLOW, R. Tumours of the carotid body. *Annals of Surgery*, 1916, lxiv., Sept., p. 257.

CLINICAL NEUROLOGY.

GENERAL—

ROSENOW, E. C. Elective localisation of bacteria in diseases of the nervous system. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 26, p. 662.

AUSTREGESILO, A., and TEIXEIRA-MENDES, R. De l'association des réflexes (synréflexies). *Rev. Neurol.*, 1916, xxiii., Août-Sept., p. 162.

ALMEIDA, M. O. DE, and ESPOSEL, F. Action de l'anémie expérimentale produite par la bande d'Esmarch sur les réflexes. *Rev. Neurol.*, 1916, xxiii., Août-Sept., p. 169.

MONIZ, EGAS. Le signe de la flexion plantaire du pied avec la jambe en flexion. *Rev. Neurol.*, 1916, xxiii., Août-Sept., p. 173.

GUNSON, E. B. A crossed hip reflex in enteric fever. *Lancet*, 1916, cxci., Sept. 16, p. 520.

MUSCLES—

LORTAT-JACOB, L., and SÉZARY, A. Maladie de Thomsen. *Rev. Neurol.*, 1916, xxiii., Juillet, p. 15.

RICCA, SILVIO. Sul diverso comportamento della contrazione muscolare nel morbo di Thomsen. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Agosto, p. 322.

NERVES—

CRAIG, C. BURNS. Injuries to the peripheral nerves produced by modern warfare. *Amer. Journ. Med. Sci.*, 1916, cliii., Sept., p. 368.

HESNARD, A. Le traitement des lésions des troncs nerveux par la radiothérapie des cicatrices nerveuses. *Archives d'Electricité Méd.*, 1916, xxiv., Sept., pp. 273-295 and 305.

LAW, A. A. Brachial plexus surgery. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 16, p. 865.

WHITE, J. RENFREW. The extent and nature of the sensory loss in musculo-spiral paralysis. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Sept., p. 340.

SPINAL CORD—

General.—RIDLON, JOHN. Report of two cases of scoliosis, accompanied by pressure paralysis of the lower limbs. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 9, p. 803.

WEISENBURG, T. H. The clinical value of defence and muscle reflexes: importance of the latter in spinal localisation. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 217.

JONAS, A. F. Dislocation of the first cervical vertebra. *Annals of Surgery*, 1916, lxiv., Aug., p. 248.

Cervical Ribs.—JOHANSSON, SVEN. Ein operierter Fall von Halsrippe. *Nord. Med. Arkiv*, 1915, xlviii. (Kirurgi), Afd. 1, h. 3-4, N:r. 10, S. 1-5.

Tabes.—DAVIS, E. D. D. Centrally caused bilateral laryngeal abductor paralysis in tabes, with a report of the post-mortem examination. *Journ. of Laryngol., Rhinol., and Otol.*, 1916, xxxi., Sept., p. 361.

Poliomyelitis Anterior Acuta.—TAYLOR, E. W. Recurrent poliomyelitis: second attack after a period of three years. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 207.

NEAL, JOSEPHINE B., and DUBOIS, PHEBE. The diagnosis of poliomyelitis. *Amer. Journ. Med. Sci.*, 1916, clii., Sept., p. 313.

RICHARDSON, MARK W. The rat and infantile paralysis: a theory. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 21, p. 397.

LEWIS, P. M. Report of seventy-seven cases of acute poliomyelitis treated in the New York Throat, Nose, and Lung Hospital by intraspinal injections of adrenalin chloride. *Med. Record*, 1916, xc., Sept. 23, p. 540.

WYNKOOP, W. D. Reflections on poliomyelitis. *Med. Record*, 1916, xc., Sept. 23, p. 545.

RUECK, G. A. Three cases of acute anterior poliomyelitis treated successfully by transfusion of citrated normal blood of adults. *Med. Record*, 1916, xc., Sept. 30, p. 587.

GORDON, ALFRED. Acute anterior poliomyelitis. *N. Y. Med. Journ.*, 1916, civ., Sept. 23, p. 583.

WIGHT, LUCY O. Anterior poliomyelitis: the aftermath. *N. Y. Med. Journ.*, 1916, civ., Sept. 23, p. 585.

FRAUENTHAL, H. C. Infantile paralysis. *N. Y. Med. Journ.*, 1916, civ., Sept. 30, p. 635.

ROBINSON, B. Afterthought of the epidemic of infantile paralysis. *N. Y. Med. Journ.*, 1916, civ., Sept. 30, p. 638.

FLEXNER, SIMON. The nature, manner of conveyance, and means of prevention of infantile paralysis. *Pediatrics*, 1916, xxviii., Aug., p. 341.

HOYNE, A. L., and CEPELKA, F. P. Poliomyelitis, with some observations on thirty cases. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 26, p. 666.

SOPHIAN, A. Municipal control of infantile paralysis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Aug. 26, p. 669.

THOMAS, H. B. The paralysis of poliomyelitis. Its treatment in the early stages. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 23, p. 949.

MATHERS, G. Some bacteriologic observations on epidemic poliomyelitis: preliminary report. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 30, p. 1019.

FLEXNER, SIMON. The nature, manner of conveyance, and means of prevention of infantile paralysis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 562.

KOPLIK, HENRY. Acute poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 575.

EMERSON, HAVEN. The importance of the present epidemic of poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 584.

DRAPER, GEORGE. Abortive and non-paralytic cases of poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 590.

AGER, LOUIS C. The present epidemic of poliomyelitis—the types which it presents. *Archives of Ped.*, 1916, xxxiii., Aug., p. 592.

NEAL, JOSEPHINE B. Laboratory aids in the diagnosis of poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 595.

WALLACE, CHARLTON. Orthopædic observation in the treatment of anterior poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 599.

BASS, MURRAY H. The treatment of the acute stage of poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Aug., p. 611.

BRAIN—

Skull Injury, &c.—MOUTIER, FRANCOIS. Recherches sur les troubles labyrinthiques chez les commotionnés et blessés du crâne. *Rev. Neurol.*, 1916, xxiii., Juillet, p. 9.

SARGEANT, P., and HOLMES, GORDON. Report on the later results of gunshot wounds of the head. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Sept., p. 300.

HARWOOD, T. E. Three cases illustrating the functional consequences of head injuries. *Lancet*, 1916, cxci., Sept. 2, p. 431.

Meningitis.—SHARPE, C. T. Meningococcus meningitis with unusual hæmorrhagic manifestations and demonstration of the diplococcus in the skin. *Archives of Pediatrics*, 1916, xxxiii., Sept., p. 641; *Journ. Cut. Dis.*, 1916, xxxiv., Sept., p. 659.

NETTER, ARNOLD, and SALANIER, MARIUS. Présence des méningocoques dans les éléments purpuriques de l'infection méningococcique. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 670.

EASTWOOD, A. Bacteriological aspects of the meningococcus carrier problem. *Journ. of Hygiene*, 1916, xv., Sept., p. 495.

GRIFFITH, FRED. Identification of the meningococcus in the naso-pharynx, with special reference to serological reaction. *Journ. of Hygiene*, 1916, xv., Sept., p. 446.

SCOTT, W. M. A study of meningococci occurring in the spinal fluid, and of similar organisms in the nasopharynx. *Journ. of Hygiene*, 1916, xv., Sept., p. 464.

GORDON, M. H. Preliminary observations on disinfection of the nasopharynx of meningococcus carriers by means of air saturated with a solution of disinfectant. *Journ. Roy. Army Med. Corps*, 1916, xxvii., p. 92.

TORREY, ROBERT G. Influenzal meningitis, with report of a case. *Amer. Journ. Med. Sci.*, 1916, cliii., Sept., p. 403.

BROWN, A. CARNARVON. Pneumococcal meningitis with recovery following vaccine therapy. *Lancet*, 1916, cxci., Sept. 16, p. 519 (illust.).

NETTER, ARNOLD. Développement d'un zona, dans le domaine du plexus lombaire et du plexus sacré, à l'occasion d'une méningite cérébro-spinale. Réapparition d'un zona dans le plexus lombaire, six mois après, au cours de la convalescence d'une pneumonie. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 755.

GUTHRIE, DOUGLAS. Note on the value of hexamine in aural suppuration and in meningitis. *Brit. Med. Journ.*, 1916, Sept. 30, p. 455.

Hydrocephalus.—MOFFETT, R. D. An unusual case of hydrocephalus. *Archives of Pediatrics*, 1916, xxxiii., Sept., p. 679.

Progressive Muscular Atrophy.—SHEEHAN, R. F. A case of progressive muscular atrophy. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 743.

Family Spastic Paralysis.—RHEIN, JOHN H. W. Family spastic paralysis. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 224.

Hæmorrhage.—SACHS, B., and ELSBERG, C. A. Extensive subdural hæmorrhage after trauma. *N. Y. Med. Journ.*, 1916, civ., Sept. 30, p. 633.

Embolism.—MAKINS, SIR G. H. A series of cases of cerebral embolism consequent on the reception of gunshot injury to the carotid arteries. *Lancet*, 1916, cxci., Sept. 23, p. 543.

Hemiplegia.—MARTIN, WM. Hemiplegia. *N. Y. Med. Journ.*, 1916, civ., Sept. 16, p. 544.

MARIE, PIERRE, and FOIX, CH. Les syncinesies des hémiplégiques, leur physiologie, leur pathogénie, leur intéret théorique et pratique. *Rev. Neurol.*, 1916, xxiii., Août-Sept., p. 145.

PAULIAN, DÉMÉTRE-EM-. Sur quelques cas d'hémiplégie cérébelleuse. *Rev. Neurol.*, 1916, xxiii., Juillet, p. 18.

BABONNEIX, L. Hémiplégies de l'enfance et syphilis héréditaire. *Rev. Neurol.*, 1916, xxiii., Juillet, p. 1.

Tumour.—TURNER, C. VIOLET. A case of prolonged hyperpyrexia in a child with a mid-brain tumour. *Brit. Journ. Child Dis.*, 1916, xiii., Sept., p. 261.

KNAPP, ARNOLD. Report of a tumour at the apex of the orbit, with preservation of the eyeball, in a case of plexiform neuroma of the eyelid. Microscopical examination. *Archives of Ophthalmol.*, 1916, xlv., Sept., p. 475.

Hypopituitarism.—BOSTON, L. NAPOLEON. A case of hypopituitarism. *N. Y. Med. Journ.*, 1916, civ., Sept. 9, p. 490.

Syphilis.—THOMPSON, LOYD. The intensive treatment of syphilis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 734.

STEIN, J. B. Heredosyphilitic dental stigmata. *Med. Record*, 1916, xc., Sept. 9, p. 445.

McNEIL, H. L. Syphilis in the Southern negro. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 30, p. 1001.

BONARD, N. S. A new remedy for syphilis, Luargol or "102." *Lancet*, 1916, cxci., Sept. 23, p. 554.

UBEL, GEORGE B. A test for syphilis. *N. Y. Med. Journ.*, 1916, civ., Sept. 9, p. 503.

Salvarsan.—WALKER, I. C., and HALLER, D. A. The treatment of syphilis of the central nervous system. With intravenous salvarsan alone, with intravenous salvarsan and intraspinal salvarsanised serum together, and with intraspinal salvarsanised serum alone. *Archives Int. Med.*, 1916, xviii., Sept., p. 376.

WESTROPE, LIONEL L. The value of a milk diet prior to the use of kharsivan or salvarsan. *Brit. Med. Journ.*, 1916, Sept. 30, p. 456.

Luetin Reaction.—KOLMER, J. A., NATSUNAMI, T., and BROADWELL, S. The effect of potassium iodide on the luetin reaction. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 718.

Wassermann Reaction.—JONES, W. RAY. The Wassermann reaction in 251 tuberculous dispensary cases. *Med. Record*, 1916, xc., Sept. 2, p. 418.

MINOR, J. C. The wake of the Wassermann test. *N. Y. Med. Journ.*, 1916, civ., Sept. 30, p. 651.

Cerebro-Spinal Fluid.—NAKANO, H. The value of various diagnostic methods for the cerebro-spinal fluid. *Journ. Cut. Dis.*, 1916, xxxiv., p. 179.

Pellagra.—SILER, J. F., GARRISON, P. E., and MACNEAL, W. J. The subsequent history of pellagrins in Spartanburg County, S.C., who survived the initial attack. *Archives Int. Med.*, 1916, xviii., Sept., p. 340.

YARBOROUGH, J. F. Pellagra; its etiology and treatment. *Med. Record*, 1916, xc., Sept. 2, p. 416.

Epilepsy.—FLOOD, EVERETT. Epilepsy. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 21, p. 408.

FISCHBEIN, E. C. A classification of the epilepsies. *Med. Record*, 1916, xc., Sept. 2, p. 399.

REED, C. A. L. Epilepsy. *N.Y. Med. Journ.*, 1916, civ., Sept. 16, p. 529.

HINKELMANN, A. J. Reed's bacillus of epilepsy. *N.Y. Med. Journ.*, 1916, civ., Sept. 16, p. 531.

COTTON, H. A., CORSON-WHITE, E. P., and STEVENSON, W. W. The pathogenesis and treatment of epilepsy. *N.Y. Med. Journ.*, 1916, civ., Sept. 16, p. 532.

SPANGLER, R. H. Toxic manifestations of epilepsy and their rational treatment. *N.Y. Med. Journ.*, 1916, civ., Sept. 16, p. 534.

Alcoholism.—PRINGLE, J. C. Alcoholism and social service. *Brit. Journ. Inebriety*, 1916, xiv., July, p. 1.

SCHARLIEB, MARY. Alcohol in its relation to venereal disease. *Brit. Journ. Inebriety*, 1916, xiv., July, p. 12.

PATRICK, G. T. W. Alcohol and war from the psychological standpoint. *Brit. Journ. Inebriety*, 1916, xiv., July, p. 16.

M'IVER, JOSEPH. Treatment of inebriates. *N.Y. Med. Journ.*, 1916, civ., Sept. 30, p. 646.

Drug Addiction.—MARKENS, E. W. Drug addiction. *N.Y. Med. Journ.*, 1916, civ., Sept. 9, p. 504.

Hysteria.—SOLOMON, MEYER. The clinical imitation of hysteria. *Med. Record*, 1916, xc., Sept. 23, p. 546.

Chorea.—BAILEY, PEARCE. The hospital treatment of simple chorea. *N.Y. Med. Journ.*, 1916, civ., Sept. 23, p. 580.

GOODMAN, A. L. The auto-serum treatment of chorea. *Archives of Pediatrics*, 1916, xxxiii., Sept., p. 649.

"Shell Shock."—MYERS, CHARLES S. Contributions to the study of shell shock. Being an account of certain disorders of speech, with special reference to their causation and their relation to malingering.—IV. *Lancet*, 1916, cxci., Sept. 9, p. 461.

PORAK, RÉNÉ. Nouveaux signes physiologiques des psycho-névroses de guerre. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 630.

Neuralgia.—BECKMAN, E. H. Observations on the diagnosis and treatment of trifacial neuralgia. *Annals of Surgery*, 1916, lxiv., Aug., p. 242.

Neuritis.—KILGORE, A. R. Peripheral neuritis following emetine treatment of amœbic dysentery. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 14, p. 380.

Sciatica.—GORDON, ALFRED. Treatment of sciatica and neuritis of other peripheral nerves with hot saline solutions. *Therap. Gaz.*, 1916, xl., June, p. 392.

Polyneuritis.—LHERMITTE, J. Les lésions cérébrales de la polynévrite avitaminique (béri-béri expérimental). *Rev. Neurol.*, 1916, xxiii., Juillet, p. 6.

Exophthalmic Goitre, Cretinism, &c.—AIKINS, W. H. B. The ætiology and treatment of exophthalmic goitre, with special reference to the use of radium. *Med. Press*, 1916, cliii., Sept. 20, p. 271.

KEOGH, C. H. Graves's disease. *N.Y. Med. Journ.*, 1916, civ., Sept. 2, p. 457.

COOKE, W. E. Hyperthyroidism following scarlet fever. *Journ. Roy. Army Med. Corps*, 1916, xxvii., p. 92.

FREEMAN, J. K. Hyperthyroidosis associated with gynecomastia. *Therap. Gaz.*, 1916, xl., p. 9.

STANDISH, MYLES. Retrobulbar neuritis with central scotoma from toxic action of thyroidin. *Archives of Ophthalmol.*, 1916, xlv., Sept., p. 469.

Addison's Disease.—TIEKEN, THEODORE. Addison's disease: report of a case with acute onset, terminating in rapid improvement and complete recovery. *Amer. Journ. Med. Sci.*, 1916, cliii., Sept., p. 422.

Tetanus.—BIRD, FRANK. Report of a case of tetanus. *Therap. Gaz.*, 1916, xl., Jan., p. 6.

SCHEINKMAN, B. Recovery from tetanus. *N.Y. Med. Journ.*, 1916, civ., Sept. 9, p. 505.

MONTAIS. Sur les tétanos post-sériques et en particulier sur le tétanos sans trismus. *Annales de l'Institut Pasteur*, 1916, xxx., p. 330.

SPECIAL SENSES AND CRANIAL NERVES—

WALKER, CLIFFORD B., and CUSHING, HARVEY. Studies of optic nerve atrophy in association with chiasmal lesions. *Archives of Ophthalmol.*, 1916, xlv., Sept., p, 407.

MILLS, LLOYD. Complete vocational disability from muscular imbalance of the eyes. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 737.

GOT. War deafness from lesion of the internal ear. (Translated by Macleod Yearsley.) *Journ. of Laryngol., Otol., and Rhinol.*, 1916, xxxi., Sept., p. 374.

MACGIBBON, T. A. Two cases of referred sensation (Arnold's branch of vagus nerve). *Journ. of Laryngol., Rhinol., and Otol.*, 1916, xxxi., Sept., p. 380.

MISCELLANEOUS SYMPTOMS AND CASES—

D'ESPINE, AD., and DEMOLE, V. Tubercules de la protubérance. *Rev. Neurol.*, 1916, Août-Sept., p. 176.

PUTNAM, JAMES J. Acroparesthesia. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Sept., p. 193.

CORIAT, ISADOR H. Dystonia musculorum deformans. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 14, p. 383.

BRIAND, M., and PHILIPPE, J. L'audi-mutité rebelle, d'origine émotionnelle. *Prog. Méd.*, 1916, Sept. 5, p. 145.

WILSON, W. T. Lumbar puncture for the relief of convulsions in puerperal eclampsia. Report of two cases. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Sept. 2, p. 742.

WOLF, H. F. The symptom ataxia. *N.Y. Med. Journ.*, 1916, civ., Sept. 9, p. 494.

SOLOMON, MEYER. The syndrome of asthenia, of mental origin. *N.Y. Med. Journ.*, 1916, civ., Sept. 2, p. 449.

WILLIAMS, P. H. Psychic vaginismus, with a report of two cases. *Amer. Journ. Obstetrics*, 1916, lxxiv., Aug., p. 226.

PSYCHIATRY.

GENERAL—

GIBSON, GORDON. The relationship between pelvic disease and manic-depressive insanity. *Amer. Journ. Obstetrics*, 1916, lxxiv., Sept., p. 439.

LUGARO, E. La psichiatria tedesca nella storia e nell' attualità.—IV. Le psicosi funzionali. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Sett., p. 449 (cont.).

POROT, M. Les bases de l'expertise mentale dans les bataillons d'Afrique et les groupes spéciaux en temps de guerre (aptitude au service et responsabilité militaire). *Rev. Neurol.*, 1916, xxiii., Juillet, p. 24.

LOGRE, B.-I. Sur quelques cas de fugue pathologique devant l'ennemi. *Rev. Neurol.*, 1916, xxiii., Juillet, p. 20.

SOUTHARD, E. E. The major divisions of mental hygiene—public, social, individual. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 21, p. 404.

STEARNS, A. WARREN. What recent investigations have shown to be the relation between mental defect and crime. *Boston Med. and Surg. Journ.*, 1916, clxxv., Sept. 21, p. 406.

BRYCE, PETER. Tuberculosis in relation to feeble-mindedness. *N. Y. Med. Journ.*, 1916, civ., Sept. 9, p. 481.

FRIEDMAN, H. M. Occupational specialisation in the defective. *N. Y. Med. Journ.*, 1916, civ., Sept. 23, p. 587.

Bibliography

ANATOMY.

HILTON, WM. A. The nervous system of pycnogonids. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 463 (21 figs.).

JOHNSTON, J. B. Evidence of a motor pallium in the forebrain of reptiles. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 475 (1 fig.).

JOHNSTON, J. B. The development of the dorsal ventricular ridge of turtles. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 481 (27 figs.).

BAILEY, P. The morphology and morphogenesis of the choroid plexuses, with especial reference to the development of the lateral telencephalic plexus of *Chrysemys marginata*. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 507 (27 figs.).

KOCH, SUMNER L. The structure of the third, fourth, fifth, sixth, ninth, eleventh, and twelfth cranial nerves. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 541 (5 figs.).

THOMPSON, C. B. The brain and the frontal gland of the castes of the "white ant," *Leucotermes flavipes*, Kollar. *Journ. Comp. Neurol.*, 1916, xxvi., Oct., p. 553 (26 figs.).

PHYSIOLOGY.

LEVY, R. L. Studies on the conditions of activity in endocrine glands.—IV. The effect of thyroid secretion on the pressor action of adrenin. *Amer. Journ. Physiol.*, 1916, xli., p. 492.

HOSKINS, R. G., GUNNING, R. E. LEE, and BERRY, E. L. The effects of adrenin on the distribution of the blood.—I. Volume changes and venous discharge in the limb. *Amer. Journ. Physiol.*, 1916, xli., p. 513.

MARINE, D., and ROGOFF, J. M. How rapidly does the intact thyroid gland elaborate its specific iodin-containing hormone? *Journ. Pharmacol. and Exper. Therap.*, 1916, ix., Oct., p. 1.

HATCHER, R. A., and SMITH, M. I. The elimination of strychnine by the kidneys. *Journ. Pharmacol. and Exper. Therap.*, 1916, ix., Oct., p. 27.

ROGOFF, J. M., and MARINE, D. Effect on tadpoles of feeding thyroid products obtained by alkaline hydrolysis. *Journ. Pharmacol. and Exper. Therap.*, 1916, ix., Oct., p. 57.

PSYCHOLOGY.

TALMEY, B. S. The psychology of the faddist. *N. Y. Med. Journ.*, 1916, civ., Oct. 7, p. 686.

PATHOLOGY.

TROCELLO, E. Contributo allo studio della ectromelia radiale longitudinale. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Ott., p. 522.

UGOLOTTI, F. Sulla compartecipazione di ambedue gli emisferi cerebrali alla funzione del linguaggio. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Ott., p. 539.

CLINICAL NEUROLOGY.

GENERAL—

RANKIN, GUTHRIE. The highly strung nervous system. *Brit. Med. Journ.*, 1916, Oct. 21, p. 545.

BOVERI, PIERO. Fatti nuovi di Semeiotica nervosa. Il riflesso della seconda falange dell' alluce. Presenza o scomparsa del fenomeno di Babinski a seconda della posizione del malato. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Ott., p. 350.

CULPIN, M. Practical hints on functional disorders. *Brit. Med. Journ.*, 1916, Oct. 21, p. 548.

BONHOMME and NORDMANN. Caractères essentials de la commotion cérébro-spinale. *Prog. Med.*, 1916, Oct. 20, p. 194.

SPINAL CORD—

General.—GREENBERG, GEZA. Cystoscopy as a diagnostic aid in spinal cord diseases. *Med. Record*, 1916, xc., Oct. 7, p. 634.

Myelitis.—HASSIN, G. B. Histopathological changes in five cases of myelitis. *Med. Record*, 1916, xc., Oct. 7, p. 619.

Tabes.—LANTMAN, M. F. Cardiac crises in tabes dorsalis. Report of a case with sudden death. *Med. Record*, 1916, xc., Oct. 21, p. 722.

CLARKE, FRED. B. A study of proximo- and acro-ataxia in tabes dorsalis. *Amer. Journ. Med. Sci.*, 1916, cliii., Oct., p. 574.

Poliomyelitis Anterior Acuta.—ROSENOW, E. C., TOUNE, E. B., and WHEELER, G. W. The etiology of epidemic poliomyelitis: preliminary note. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 28, p. 1202.

NUZUM, JOHN W., and HERZOG, M. Experimental studies in the etiology of acute epidemic poliomyelitis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 28, p. 1205.

WELLS, C. W. Immune human serum in the treatment of acute poliomyelitis. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 28, p. 1211.

ASHLEY, DEXTER D. The postfebrile treatment of anterior poliomyelitis. *N.Y. Med. Journ.*, 1916, civ., Oct. 14, p. 725.

BRYANT, W. SOHIER. Epidemic poliomyelitis. *N.Y. Med. Journ.*, 1916, civ., Oct. 14, p. 727.

LOVETT, ROBERT W. The management of poliomyelitis, with a view to minimising the ultimate disability. *Med. Record*, 1916, xc., Oct. 21, p. 705.

COHN, A. Prevention and limitation of deformity in infantile paralysis. *Therap. Gaz.*, 1916, xl., Oct., p. 687.

Meningitis.—COLLINS, SIR WM. J. Cerebro-spinal fever: a review of the report to the Medical Research Committee under the National Insurance Act. *Med. Press*, 1916, cliii., Oct. 11, p. 336.

WELSH, D. A., and BROWN, WOLFE S. The intensive specific treatment of epidemic cerebro-spinal meningitis. *Med. Journ. Australia*, 1916, ii., Aug. 12, p. 113.

BROADBENT, WALTER. Treatment of meningitis. *Brit. Med. Journ.*, 1916, Oct. 28, p. 586.

HORT, EDWARD C., and CAULFIELD, ALFRED. Epidemic cerebro-spinal fever: the place of the meningococcus in its etiology. *Brit. Med. Journ.*, 1916, Oct. 14, p. 522.

ADAMI, J. G. On the life-history of the meningococcus and of other bacteria. *Brit. Med. Journ.*, 1916, Oct. 14, p. 525.

HALL, WALKER, and PETERS, B. A. I. Changes in the agglutinability, fermentation reactions, and absorptive capacities of the meningococcus during the acute attack. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Oct., p. 399.

Thrombosis.—MACADAM, WM. Thrombosis of the cerebral arteries in paratyphoid B. *Journ. Roy. Army Med. Corps*, 1916, xxvii., Oct., p. 499.

Tumour.—CUSHING, HARVEY. On convulsive spasm of the face produced by cerebellopontine tumours. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Oct., p. 312.

Aphasia, Aphonia, &c.—LIÉBAULT, G. Aphonie de guerre et laryngite tuberculeuse. *Rev. de Laryngol., d'Otol. et de Rhinol.*, 1916, xxxvii., Oct., p. 457.

Syphilis.—FORDYCE, JOHN A. Syphilis of the nervous system. *Journ. Cut. Dis.*, 1916, xxxiv., Oct., p. 713; *Med. Record*, 1916, xc., Sept. 30, p. 575.

FORDYCE, JOHN A. Diagnosis and general treatment of syphilis. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 469.

SWIFT, HOMER F. Treatment of syphilis of the central nervous system. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 490.

CORSO, G. La reazione di Hermann-Perutz nelle affezioni sifilitiche del sistema nervoso. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Ott., p. 513.

WARTHIN, A. S. Persistence of active lesions and spirochætes in the tissues of clinically inactive or "cured" syphilis. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 508.

VEEDER, BORDEN. Hereditary syphilis in the light of recent clinical studies. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 522.

CHURCHILL, F. S. Frequency of hereditary syphilis. *Amer. Journ. Dis. Child.*, 1916, xii., Oct., p. 355.

POST, ABNER. Clinical course and physical signs in hereditary syphilis of early age. *Amer. Journ. Dis. Child.*, 1916, xii., Oct., p. 364.

JEANS, P. C. Clinical signs and diagnosis of late hereditary syphilis. *Amer. Journ. Dis. Child.*, 1916, xii., Oct., p. 374.

SYLVESTER, PHILIP H. Treatment of hereditary syphilis. *Amer. Journ. Dis. Child.*, 1916, xii., Oct., p. 395.

KOLMER, J. A., BROADWELL, S., JR., and MATSUNAMI, T. Agglutination of *Treponema pallidum* in human syphilis. *Journ. Exp. Med.*, 1916, xxiv., p. 333.

Salvarsan.—WADIA, M. D. Death following the intravenous injection of salvarsan. *Indian Med. Gaz.*, 1916, li., Oct., p. 380.

ROBERTSON, A. ROCKE. The intraspinal treatment of syphilis of the central nervous system, with the report of cases. *Brit. Med. Journ.*, 1916, Oct. 7, p. 482.

SWIFT, HOMER F. A study of serum salvarsanised *in vitro*. *Journ. Exper. Med.*, 1916, xxiv., Oct., p. 373.

MOLESWORTH, E. H. Arsenobenzol substitutes for German salvarsan. *Med. Journ. Australia*, 1916, ii., Aug. 19, p. 129.

DALIMIER and LEVY-FRÄNCKEL. Danysz "102" (Luargol) in the treatment of malignant or acute syphilis. *Med. Journ. Australia*, 1916, ii., Aug. 19, p. 130.

Neosalvarsan.—McNERTHNEY, J. B., and McNERTHNEY, W. B. Trichinosis, immediate result following intravenous injection of neosalvarsan. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1086.

Wassermann Reaction.—ROWE, A. H. The albumin and globulin content of human blood serum in health, syphilis, pneumonia, and certain other infections, with the bearing of globulin on the Wassermann reaction. *Archives Int. Med.*, 1916, xviii., p. 455.

FILDES, P., and M'INTOSH, JAMES. A method of applying the Wassermann reaction in large numbers. *Lancet*, 1916, cxci., Oct. 28, p. 751.

WILLIAMS, P. F., and KOLMER, J. A. The Wassermann reaction in gynecology. *Amer. Journ. Obstetrics*, 1916, lxxiv., Oct., p. 638.

Luetin Reaction.—FLETCHER, WM. The luetin reaction in syphilis. *Lancet*, 1916, cxci., Oct. 21, p. 710.

DE BUYS, L. R., and LANGFORD, J. A. A comparative study of the luetin and Wassermann reactions in infancy and childhood. *Amer. Journ. Dis. Child.*, 1916, xii., Oct., p. 387.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—AIMÉ, HENRI, and PERRIN, EMILE. Considérations sur un cas d'épilepsie partielle guérie après extraction du projectile intra-cérébral. *Prog. Méd.*, 1916, Oct. 5, p. 187.

THOM, D. A. A second note on the frequency of epilepsy in the offspring of epileptics. *Boston Med. and Surg. Journ.*, 1916, clxxv., Oct. 26, p. 599.

JOUGHIN, JAMES L. The epileptic syndrome and glandular therapy. *N. Y. Med. Journ.*, 1916, civ., Oct. 7, p. 693.

WHERRY, W. B., and OLIVER, W. W. Blood cultures in epilepsy. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1087.

CARO, H., and THOM, D. A. A bacteriologic study of the blood of seventy epileptics, with special reference to the *Bacillus epilepticus* of Reed. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1088.

TERHUNE, WM. B. A bacillus isolated from epileptics: preliminary report. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 28, p. 1155.

REED, C. A. L. Constipation and intestinal infection in epileptics. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 28, p. 1157.

Hysteria.—HABERMAN, J. V. Brain tumour or hysteria. *Med. Record*, 1916, xc., Oct. 7, p. 624.

Alcoholism.—COLLINS, SIR WM. J. War and measures against inebriety. *Brit. Journ. Inebriety*, 1916, xiv., Oct., p. 41.

D'ABERNON, LORD. Some aspects of the drink problem. *Brit. Journ. Inebriety*, 1916, xiv., Oct., p. 45.

Drug Addictions.—LUYSSEN, L. Cocaine accidents and cocainomania. *Med. Press*, 1916, cliii., Oct. 4, p. 321.

Neuritis.—PATRICK, HUGH T. Facial diplegia in multiple neuritis. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Oct., p. 322.

RUTHERFURD, W. J. Meralgia paræsthetica. *Brit. Med. Journ.*, 1916, Oct. 28, p. 583.

Neurasthenia.—RIGGS, A. FOX. Treatment of neurasthenia. *Bull. Johns Hopkins Hosp.*, 1916, xxvi., Oct., p. 281.

"Shell Shock."—GARTON, WILFRID. Shell shock and its treatment by cerebro-spinal galvanism. *Brit. Med. Journ.*, 1916, Oct. 28, p. 584.

TOMBLESON, J. B. A series of military cases treated by hypnotic suggestion. *Lancet*, 1916, cxci., Oct. 21, p. 707.

Exophthalmic Goitre, Myxœdema, &c.—SEYMOUR, MALCOLM. The treatment of Graves' disease by the Röntgen ray. *Boston Med. and Surg. Journ.*, 1916, clxxv., Oct. 19, p. 568.

MACKINNON, RONALD. Post-mortem findings in a case of exophthalmos of long standing, originally due to Graves' disease. *Brit. Med. Journ.*, 1916, Oct. 7, p. 488.

ANDERS, J. M. Considerations in the medical treatment of goitre. *N. Y. Med. Journ.*, 1916, civ., Oct. 21, p. 773.

GALLANT, A. E. Removal of the third lobe of a cystic goitre. *N. Y. Med. Journ.*, 1916, civ., Oct. 21, p. 778.

Tetanus.—COLSTON, J. A. C. Tetanus following gunshot wounds. *Bull. Johns Hopkins Hosp.*, 1916, xxvi., Oct., p. 294.

CLAUDE, HENRI, and LHERMITTE, J. Les contractures du tétanos tardif à évolution prolongée et leur diagnostic avec les contractures organiques ou "fonctionnelles." *Prog. Méd.*, 1916, Oct. 5, p. 187.

SPECIAL SENSES AND CRANIAL NERVES—

PARKER, W. R. The relation of choked disc to the tension of the eyeball: an experimental study. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Oct. 7, p. 1053.

MILLS, CHARLES K., and JONES, I. H. Tests by Bárány methods, demonstrating neuraxial differentiation of the fibres from the horizontal and the fibres from the vertical semicircular canals. *Journ. Amer. Med. Assoc.*, 1916, lxvii, Oct. 28, p. 1298.

MISCELLANEOUS SYMPTOMS AND CASES—

GREIG, D. M. Two cases of ischæmic contracture of unusual origin. *Clin. Journ.*, 1916, xlv., Oct. 4, p. 361.

ADAMS, P. H. The influence of vascular disease in the retina on the prognosis as regards life. *Birmingham Med. Review*, 1916, lxxx., Oct., pp. 87-93.

DANA, C. L., and GERE, BELDEN. Report of a case illustrating the anatomical seat of mobile spasms. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 535.

RIGGLES, J. L. Relation of convulsions to pelvic disease. *Amer. Journ. Obstetrics*, 1916, lxxiv., Oct., p. 662.

THOMAS, J. J., and SEVER, J. W. Obstetrical paralysis. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Oct., p. 289.

MILLER, T. GRIER. Metabolism studies in angioneurotic œdema. *Archives Int. Med.*, 1916, xviii., Oct., p. 557.

MILLER, JOSEPH L. Relation of the hypophysis to certain clinical manifestations and the therapeutic application of its extracts. *Amer. Journ. Med. Sci.*, 1916, clii., Oct., p. 549.

PSYCHIATRY.

GENERAL PARALYSIS—

SINGER, H. D., and QUANTZ, W. B. The autolysis of nitrogenous compounds of the blood serum in general paralysis and dementia præcox, with its bearing on the Abderhalden test. *Archives Int. Med.*, 1916, xviii., Oct., p. 529.

GENERAL—

GRECO, FR. DEL. La mentalità delle aristocrazie e gli studii dell' alienista Paolo Iacoby. *Riv. ital. di Neuropatol., Psichiat. ed Elettroter.*, 1916, ix., Ott., pp. 391-413.

Bibliography

ANATOMY.

SANO, F. The convolutional pattern of the brain of identical twins: a study on hereditary resemblance in the furrows of the cerebral hemispheres. *Phil. Trans. Roy. Soc.*, 1916, ccviii., Ser. B., pp. 37-61 (5 figs.).

BYRANT, W. SOHIER. Sensory elements in the human cerebral hypophysis. *Anat. Record*, 1916, xi., p. 25 (1 fig.).

KING, HELEN DEAN. On the post-natal growth of the body and of the central nervous system in albino rats that are undersized at birth. *Anat. Record*, 1916, xi., p. 41.

SMITH, P. E. The effect of hypophysectomy in the early embryo upon the growth and development of the frog. *Anat. Record*, 1916, xi., p. 57 (10 figs.).

PAPPENHEIMER, ALWIN M. The Golgi apparatus. Personal observations and a review of the literature. *Anat. Record*, 1916, xi., p. 107.

HUBER, G. CARL. On the form and arrangement in fasciculi of striated voluntary muscle fibres. *Anat. Record*, 1916, xi., Nov., p. 149 (4 figs.).

HUBER, G. CARL. A note on the structure of the elastica interna of arteries. *Anat. Record*, 1916, xi., Nov., p. 169.

PHYSIOLOGY.

CARNIOL, A. Note sur la perméabilité des meninges à la phloridzine. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 892.

MARINESCO, G. Sur la disparition successive de l'excitabilité réflexe de l'excitabilité nerveuse et musculaire dans l'agonie et après la mort. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 874.

RABAUD, ETIENNE. Généralité du réflexe d'immobilisation chez les Arthropodes. *Compt. Rend. Soc. de Biol.*, 1916, lxxix, p. 823.

RABAUD, ETIENNE. Nature et mécanisme de l'immobilisation réflexe des Arthropodes *Compt. Rend. Soc. de Biol.*, 1916, lxxix, p. 826.

FENGER, FRED. Phosphatides in the ductless glands. *Journ. Biol. Chem.*, 1916, xxvii., Nov., p. 303.

PSYCHOLOGY.

CAILLER, CH. L'influence du facteur a priori dans l'evaluation de la probabilité des causes. *Archives de Psychol.*, 1916, xvi., Juillet, p. 1.

EVARD, M. Le test d'association-couple à l'école primaire. *Archives de Psychol.*, 1916, xvi., Juillet, p. 24.

DESCŒUDRES, A. Couleur, position ou nombre? *Archives de Psychol.*, 1916, xvi., Juillet, p. 37.

CLAPARÈDE, ED. Profils psychologiques gradués d'après l'ordination des sujets. *Archives de Psychol.*, 1916, xvi., Juillet, p. 70.

BROWNING, WM. The rôle of doctors' sons in the Lincoln administration. A contribution to the psychology of government. *Med. Record*, 1916, xc., Oct. 28, p. 762.

BRAM, ISRAEL. Dreams and dreamers. *Med. Record*, 1916, xc., Nov. 4, p. 799.

PATHOLOGY.

JACKSON, HARRY. Perithelioma of hypophysis. *Trans. Chicago Path. Soc.*, 1916, x., Oct., p. 110.

NAGEOTTE, J., and GUYON, L. Aptitudes néoplasiques de la névroglie périphérique greffée et non réinnervée; conséquences au point de vue chirurgical. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 984.

PFEIFFER, J. A. F. A note concerning strains of *Treponema pallidum* obtained from the brains of paretics at autopsy. *Proc. Soc. Exp. Biol. and Med.*, 1916, xiv., i. (1179).

MACFIE, J. W. SCOTT. The morphology of certain spirochætes of man and other animals. *Annals of Trop. Med. and Parasitol.*, 1916, x., Dec., p. 305.

CLINICAL NEUROLOGY.

GENERAL—

PETZETAKIS, M. Effets réflexes de la compression oculaire à l'état normal. Reflexes: oculo-cardiaque, oculo-respiratoire, oculo-vasomoteur. *Journ. de Physiol. et de Path. gen.*, 1915, xvii., Dec., p. 1027.

DANIELOPOLU, D., and DANULESCU, V. Extrasystoles provoquées par la compression oculaire dans la bradycardie nerveuse. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 879.

FINKELSTEIN, H. Joint hypotonia. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 942.

NERVES—

CLAUDE, HENRI. War neurology: traumatic lesions of nerves by projectiles. *Med. Press*, 1916, n.s. cii., Nov. 22, p. 469.

SPINAL CORD—

General.—CLAUDE, HENRI, and MEURIOT, H. Le syndrome d'hypertension céphalo-rachidienne consécutif aux contusions de la région cervicale de la colonne vertébrale. *Prog. Méd.*, 1916, Dec. 5, p. 223.

Fracture, Dislocation, &c.—YOUNG, JAMES K. Compression fracture of the fifth lumbar vertebra. *N. Y. Med. Journ.*, 1916, civ., Nov. 18, p. 982.

Tumour.—BASSOE, PETER, and SHIELDS, C. L. Diffuse sarcoma of the pia enveloping entire cord. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Nov., p. 385.

Paraplegia.—NOÏCA. De la contracture dans les paraplégies spasmodiques. *Rev. Neurol.*, 1916, xxiii., Oct., p. 257.

Syringomyelia.—SPILLER, WM. G. (*a*) Syringomyelia, syringoencephalomyelia. (*b*) The function of the pyramidal tract. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Nov., p. 395.

Tabes. — MARINESCO, G. Nouvelle contribution à l'étude de l'existence d'anesthésie et d'hyperthémie locales dans l'arthropathie tabétique. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 877.

Spinal Muscular Atrophy.—COCKAYNE, E. A. Werdnig-Hoffmann type of spinal muscular atrophy. *Proc. Roy. Soc. Med.*, 1916, x., Nov. (Sect. Study Dis. of Child.), p. 15.

Subacute Combined Sclerosis.—CADWALADER, WILLIAMS B. On the diagnosis of subacute combined sclerosis of the spinal cord associated with severe anæmia. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Nov., p. 424.

Poliomyelitis Anterior Acuta.—WADE, R. B. Some cases in 1914-1916 epidemic of infantile paralysis. *Med. Journ. Australia*, 1916, ii., Oct. 28, p. 364.

STEPHENS, H. D. Poliomyelitis: some remarks upon its epidemiology, pathology, and symptomatology. *Med. Journ. Australia*, 1916, ii., Nov. 18, p. 424.

WOOD, A. JEFFREYS. Infantile paralysis: diagnosis, prognosis, prophylaxis and medical treatment. *Med. Journ. Australia*, 1916, ii., Nov. 18, p. 426.

HUGHES, W. KENT. Surgical treatment of anterior poliomyelitis. *Med. Journ. Australia*, 1916, ii., Nov. 18, p. 429.

ABRAMSON, H. L. Acute poliomyelitis. *Med. Record*, 1916, xc., Nov. 4, p. 793.

NUZUM, J. W. Bacteriologic findings in cerebro-spinal fluid in poliomyelitis: a preliminary report of the examination of 50 cases. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 11, p. 1437.

Lessons to the pediatrist from the recent epidemic of poliomyelitis. *Archives of Ped.*, 1916, xxxiii., Nov., p. 847.

BRAIN—

General.—MILLS, CHARLES K. Some clinical studies of the problems of cerebral tone. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1485.

WILLIAMS, E. M. Lesions of the frontal lobes. *Med. Record*, 1916, xc., Oct. 28, p. 764.

ROCHER and LOGRE. Volumineux hématome extra-dure-mérien exclusivement frontal, sans symptomes neurologiques de localisation. *Rev. Neurol.*, 1916, xxiii., Oct., p. 253.

YEALLAND, LEWIS R. Case of a gunshot wound involving visual centre, with visual disorientation. *Proc. Roy. Soc. Med.*, 1916, ix., July (Sect. of Ophthalmol.), p. 97.

Skull Injury, &c.—TRIADO, A. J. J. Case of fractured base of skull with compression symptoms. *Med. Journ. Australia*, 1916, ii., Oct. 7, p. 295.

DAVIS, E. D. D. Case of fracture of the base of the skull in a baby, 1¾ years. *Proc. Roy. Soc. Med.*, 1916, ix., July (Otol. Sect.), p. 88.

Meningitis.—GATÉ, J., and DIECHOSAL, M. Méningite cérébro-spinale à pseudo-méningocoque. *Journ. de Physiol. et de Path. gen.*, 1915, xvii., Dec., p. 1087.

NICHOLLS, A. C. Some observations on epidemic cerebro-spinal meningitis. *Canadian Med. Assoc. Journ.*, 1916, vi., Nov., p. 969.

SUTHERLAND, HALLIDAY. The origin and prevention of cerebro-spinal fever. *Lancet*, 1916, cxci., Nov. 11, p. 828.

WORSTER-DROUGHT, C. Observations on the treatment of cerebro-spinal fever. *Brit. Med. Journ.*, 1916, Nov. 18, p. 689.

NETTER, A., SALANIER, M., and WOLFROM. Nouveau cas de purpura suraigu, sans méningite cérébro-spinale. Nature meningococcique reconnue du vivant du malade grâce à l'examen microscopique. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix, p. 973.

NETTER, A., and SALANIER, M. Présence des méningocoques dans les éléments purpuriques de l'infection meningococcique. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 670.

GORDON, M. H., and FLACK, MARTIN. An investigation concerning the disinfection of meningococcus carriers. *Brit. Med. Journ.*, 1916, Nov. 18, p. 673.

DENEHY, W. J. Epidemic cerebro-spinal meningitis: its bacteriology and pathology. *Brit. Med. Journ.*, 1916, Nov. 18, p. 684.

GORDON, M. H., HINE, T. G. M., and FLACK, MARTIN. An experimental study of the cultural requirements of the meningococcus. Together with a description of an easily prepared medium for that micro-organism. *Brit. Med. Journ.*, 1916, Nov. 18, p. 678.

SHEARER, CRESSWELL. The toxic action of dilute pure sodium chloride solutions on the meningococcus. *Lancet*, 1916, cxci., Nov. 25, p. 902.

DOUGLAS, R. O. A point in technique in the cultivation of meningococcus. *Med. Journ. Australia*, 1916, ii., Nov. 4, p. 382.

BABES, V. Hémorragies méningées et autres manifestations hémorragiques dans la fievre recurrente. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 855.

BABES, V. Sur le diagnostic differential entre le typhus exanthématique et certaines formes hémorragiques de méningite cérébro-spinale. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 857.

GANE, T., and BUIA, I. Sur les phenomènes meningitiques pendant la fièvre recurrente chez les enfants. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 864.

MARINESCO, G. Contribution à l'étude de la pachyméningite hypertrophique. *Rev. Neurol.*, 1916, xxiii., Oct., p. 233.

WEBER, F. PARKES. Syphilitic thrombosis of the basilar artery of the brain, with remarks on syphilitic basal leptomeningitis, and on a syphilitic case in which the pituitary gland was affected. *Clin. Journ.*, 1916, xlv., Nov. 15, p. 405.

Hydrocephalus.—DOUGLAS, R. C. A case of acute hydrocephalus in cerebro-spinal meningitis. *Med. Journ. Australia*, 1916, ii., Nov. 18, p. 430.

Diplegia.—WEBER, F. PARKES. Cerebral diplegia with abnormal flexibility ("atony") of ankle-joints. *Proc. Roy. Soc. Med.*, 1916, x., Nov. (Sect. Study Dis. of Child.), p. 17.

Hemiplegia.—LONG, P. DE, and WEISENBURG, T. H. Weakness of the soft palate and of the tongue a constant symptom in hemiplegia. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1516.

LORTAT, JACOB L., and OPPENHEIM, R. Hémiplégie post-scarlatineuse. *Prog. Méd.*, 1916, Nov. 20, p. 213.

Aneurism.—KENNEDY, FOSTER. A further note on the diagnostic value of retrobulbar neuritis in expanding lesions of the frontal lobes, with a report of this syndrome in a case of aneurysm of the right internal carotid artery. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4. p. 1361.

Tumour.—BASSOE, PETER. Tumors of the third and fourth ventricles. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 11, p. 1423.

HEUER, GEORGE J., and DANDY, WALTER E. Roentgenography in the localization of brain tumour, based upon a series of one hundred consecutive cases. *Bull. Johns Hopkins Hosp.*, 1916, xxvi., Nov., p. 311 (illust.).

CUSHING, HARVEY. Anosmia and sellar distension as misleading signs in the localisation of a cerebral tumour. *Journ. Nerv. and Ment. Dis.*, 1916, xliv., Nov., p. 415.

Myasthenia.—JONES, W. A. Myasthenia gravis, with thymoma. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1354.

Dystonia Musculorum Deformans.—HUNT, J. RAMSAY. The progressive torsion spasm of childhood (Dystonia musculorum deformans): a consideration of its nature and symptomatology. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 11, p. 1430.

Aphasia, Aphonia, &c.—GREENE, J. S. Agitophasia associated with agitographia. *Med. Record*, 1916, xc., Oct. 28, p. 754.

Echinococcus.—DÉVÉ, F., and DUMONT, M. L'echinococcose cérébrale, dans ses rapports avec l'age des malades. *Compt. Rend. d. l. Soc. de Biol.*, 1916, lxxix., p. 1000.

Beri-Beri.—VEDDER, E. B. The relationship of diet to beri-beri, and the present status of our knowledge of the vitamins. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1494.

Pellagra.—SILER, J. F., GARRISON, P. E., and MACNEAL, W. J. The relation of recurrent attacks of pellagra to race, sex, and age of the patient, and to treatment of the disease. *Archives Int. Med.*, 1916, xviii., Nov., p. 652.

Syphilis.—GROVE, L. W. Treatment of cerebro-spinal syphilis, with report of cases. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 253.

HALLER, D. A., and WALKER, I. C. Syphilis with neurologic symptoms simulating other conditions: some cases and their treatment. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1497.

Salvarsan.—M'KEE, S. H., and COURTENAY, H. D. Some cases of syphilis of the eye following treatment by salvarsan. *Canadian Med. Assoc. Journ.*, 1916, vi., Nov., p. 996.

KREIDER, G. N. Economical, efficient, and speedy method of administering salvarsan and similar preparations. *Med. Record*, 1916, xc., Oct. 11, p. 854.

M'NAUGHTON, J. G. Treatment of filariasis and elephantoid conditions by intramuscular injections of salvarsan. *Journ. Trop. Med. and Hygiene*, 1916, xix., Nov. 1, p. 249.

Cerebro-Spinal Fluid.—HALLIBURTON, W. D. The possible functions of the cerebro-spinal fluid (Presidential address). *Lancet*, 1916, cxci., Nov. 4, p. 779; *Proc. Roy. Soc. Med.*, 1916, x., Nov. (Sect. of Neurol.), p. 1.

WESTON, PAUL G. Sugar content of the blood and spinal fluid of insane subjects. *Journ. Med. Research*, 1916, xxxv., Nov., p. 199.

PETTY, O. H. The spinal fluid of normal children. *N. Y. Med. Journ.*, 1916, civ., Nov. 18, p. 1004.

BOYD, W. The clinical pathology of the cerebro-spinal fluid. *Canadian Med. Assoc. Journ.*, 1916, vi., Nov., p. 984.

REVEILLET, M., NOVÉ-JOSSERAND, L., and LANGERON, L. De la disparition du glucose dans le liquide des méningites à méningocoque et de réapparition au cours du traitement. Quelques applications cliniques. *Journ. de Physiol. et de Path. gen.*, 1915, xvii., Dec., p. 1080.

CATTON, JOSEPH H. Studies of the spinal fluid during iodide medication by mouth. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1369.

BUÏA, I. Recherches sur la circulation du liquide céphalo-rachidien au moyen des injections de blue de Prusse (Méthode du professeur Gerota pour les lymphatiques) dans l'espace sous-arachnoïdien. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 873.

URECHIA, C. J., and JORGULESCU, N. L'épreuve colloïdale au mastic d'Emmanuel, dans le liquide céphalo-rachidien. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 893.

SMITH, J. WHEELER, JR., and MACNEAL, W. J. A comparative study of different methods of performing the Wassermann test for syphilis. *Proc. Soc. Exp. Biol. and Med.*, 1916, xiv., 5 (1183).

Wassermann Reaction.—OBREGIA, A., URECHIA, C. J., and CARNIOL, A. La réaction de Wassermann avec l'antigène extrait du cerveau de paralytiques généraux. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 890.

LADD, JOHN M. One thousand Wassermann reactions. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 952.

GENERAL AND FUNCTIONAL DISEASES—

Epilepsy.—SATTERTHWAITE, T. E. The blood and its vessels in epilepsy, and their treatment. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 929.

M'MURRAY, T. E. Epilepsy. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 934.

SHANAHAN, WM. T. Bromide sedation in epilepsy. *Therap. Gaz.*, 1916, xl., Nov., p. 764.

ROBINSON, LEIGH F. Chloroform in status epilepticus, with report of cases. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1522.

Chorea.—ABT, ISAAC A., and LEVINSON, A. A study of two hundred and twenty-six cases of chorea. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1342.

DAVENPORT, C. B., and MUNCEY, E. B. Huntington's Chorea in relation to heredity and eugenics. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 195.

Neuralgia.—POLLOCK, LEWIS J., and POTTER, HOLLIS E. Experimental studies of injection of the gasserian ganglion, controlled by fluoroscopy. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 4, p. 1357.

Polyneuritis.—MOORE, S. E. The abortive type of general septicæmia, following pelvic infection in pregnancy; autogenetic infection; puerperal polyneuritis. *Amer. Journ. Obstetrics*, 1916, lxxiv., Nov. 18, p. 842.

"Shell Shock."—LUMSDEN, THOMAS. The psychology of malingering and functional neuroses in peace and war. *Lancet*, 1916, cxci., Nov., p. 860.

CLARKE, J. MICHELL. Some neuroses of the war. *Clin. Journ.*, 1916, xlv., Nov. 1, pp. 381 and 395.

WILLIAMS, TOM A. On the traumatic neuroses. *Med. Press*, 1916, cliii., Nov. 1 and 8, pp. 402 and 423.

WICAHT. Les mutilations de l'organe auditif par les détonations; leurs véritables causes; moyens pratiques de les éviter. *Journ. de Méd. de Paris*, 1918, Nov., p. 165.

Exophthalmic Goitre, Cretinism, &c.—MACKENZIE, HECTOR. Exophthalmic goitre (Bradshaw lecture). *Lancet*, 1916, cxci., Nov. 11, p. 815.

OCHSNER, ALBERT J. Exophthalmic goitre. *Annals of Surgery*, 1916, lxiv., Oct., p. 385.

PORTER, MILES F. The surgical treatment of goitre. *Annals of Surgery*, 1916, lxiv., Oct., p. 395.

DAVID, VERNON C. Results of operative treatment of exophthalmic goitre. *Annals of Surgery*, 1916, lxiv., Oct., p. 400.

LÉNIEZ. Sur le goitre exophtalmique traumatique. *Prog. Méd.*, 1916, Nov. 20, p. 215.

PERN, SYDNEY. The thyroid mechanism, and its relation to endemic and thyrotoxic goitre. *Med. Journ. Australia*, 1916, ii., Nov. 11, p. 409.

SALZMAN, S. Hypothyroidism a factor in certain types of uterine hæmorrhage. *Amer. Journ. Obstetrics*, 1916, lxxiv., Nov., p. 812.

BERTINE, E. Ambulatory types of thyroid disease. *Med. Record*, 1916, xc., Nov. 18, p. 895.

Tetanus.—FENESTRE and GÉRARD. Sur l'absence de toxine tétanique dans le liquide céphalo-rachidien, chez les sujets atteints de tétanos. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 850.

Tetany.—MARINESCO, G. Un cas de tétanie post-opératoire accompagné d'accès d'épilepsie et laryngospasme. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 888.

SPECIAL SENSES AND CRANIAL NERVES—

BRAV, A. The struggle for binocular single vision. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 949.

BALLANTYNE, A. J. Some eye symptoms and their interpretation. *Glasgow Med. Journ.*, 1916, lxxxvi. (n.s. iv.), Nov., p. 257.

FULLERTON, ROBERT. Cessation of vertiginous attacks following intranasal treatment. *Glasgow Med. Journ.*, 1916, lxxxvi. (n.s. iv.), Nov., p. 286.

FRASER, J. S. The pathology of otosclerosis, congenital syphilitic deafness, and paralabyrinthitis. *Proc. Roy. Soc. Med.*, 1916, ix., July (Otol. Sect.), p. 43.

FRASER, J. S. Congenital syphilitic disease of the ear. *Proc. Roy. Soc. Med.*, 1916, ix., July (Otol. Sect.), p. 62.

FRASER, J. S. Chronic osteomyelitis of the labyrinth capsule (paralabyrinthitis) in suppurative otitis media. *Proc. Roy. Soc. Med.*, 1916, ix., July (Otol. Sect.), p. 75.

SCOTT, SYDNEY. Case of latent tuberculosis of the lateral sinus secondary to chronic suppurative otitis media; histological specimen of the sinus contents. *Proc. Roy. Soc. Med.*, 1916, ix., July (Otol. Sect.), p. 84.

MISCELLANEOUS SYMPTOMS AND CASES—

ROCHAIX, A., and DURAND, P. La réaction d'Abderhalden, au cours d'une paralysie consécutive au traitement antirabique. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 809.

GRAY, NORMAN. Pregnancy complicated by increased cerebro-spinal pressure; survival of mother and child. *Lancet*, 1916, cxci., Nov. 4, p. 792.

FISHER, LEWIS. Vertigo and sea sickness. *Med. Press*, 1916, cliii., Nov. 1, p. 406.

CAMPBELL, C. MACFIE. The neurotic child. Some familiar symptoms and their problems. *Amer. Journ. Dis. Child.*, 1916, xii., Nov., p. 425.

CANNON, W. B. Results of recent studies on ductless glands. *Journ. Amer. Med. Assoc.*, 1916, lxvii., Nov. 18, p. 1483.

EDWARD, J. G. Syndactylism. *Med. Journ. Australia*, 1916, ii., Oct. 14, p. 319.

GAUTRELET, J. Contribution à l'étude graphique et photographique du mouvement. *Compt. Rend. Soc. de Biol.*, 1916, lxxix., p. 685.

TAYLOR, G. H. Colour and its relation to tune. *Med. Journ. Australia*, 1916, ii., Oct. 14, p. 316.

POTTENGER, F. M. The relationship between the nervous system and therapeutics in pulmonary tuberculosis. *N. Y. Med. Journ.*, 1916, civ., Nov. 11, p. 939.

PSYCHIATRY.

GENERAL PARALYSIS—

COCKAYNE, E. A. Case of juvenile general paralysis with hypopituitarism. (With demonstrations of speech inscriptions by E. W. Scripture, M.D.) *Proc. Roy. Soc. Med.*, 1916, x., Nov. (Sect. Study Dis. of Child.), p. 9.

DUNTON, WM. RUSH, JR., and SARGENT, G. F. Duration of paresis following treatment. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 241.

GENERAL—

PETERY, ARTHUR K. Induced paranoiac conditions. *Med. Record*, 1916, xc., Nov. 4, p. 807.

CARPENTER, C. R. The hormone equation of the psychoses. *Med. Record*, 1916, xc., Nov. 11, p. 843.

LAMBERT, CHARLES I. The clinical and anatomical features in Alzheimer's disease and related conditions. *Psychiatric Bulletin*, 1916, ix., Oct., p. 413.

MILLS, GEORGE W., and WEARNE, RAYMOND G. Some clinical deductions based on the occurrence of acetone in the urine of the acutely insane. *Psychiatric Bulletin*, 1916, ix., Oct., p. 433.

WELLS, FRED. LYMAN. Mental regression: its conception and types. *Psychiatric Bulletin*, 1916, ix., Oct., p. 445.

ADLER, HERMAN M. Indications for wet packs in psychiatric cases; an analysis of one thousand packs given at the Psychopathic Hospital, Boston, Massachusetts. *Boston Med. and Surg. Journ.*, 1916, clxxv., Nov. 9, p. 673.

RUSSELL, WM. L. What the State Hospital can do in mental hygiene. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 157.

BURR, C. B. Art in the insane. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 165.

BRIGGS, L. VERNON. Environmental origin of mental disease in certain families. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 223.

HOLBROOK, C. S. Syphilis in the East Louisiana Hospital for the insane. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 261.

PARKER, BERYL. The psychograph of Rossolimo. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 273.

KENISTON, JAMES M. Further recollections of a psychiatrist. *Amer. Journ. Insanity*, 1916, lxxiii., Oct., p. 295.

FRIEDMAN, H. M. Mental hygiene. *Med. Record*, 1916, xc., Nov. 18, p. 884.

LIND, W. A. T. Aetiology of congenital mental deficiency. *Med. Journ. Australia*, 1916, ii., Oct. 14, p. 313.

LUGARO, E. La psichiatria tedesca nella storia e nell' attualità. *Riv. di Patol. nerv. e ment.*, 1916, xxi., Nov., pp. 577-617.

TREATMENT.*

MORIN. Les courants intermittents de basse tension dans le traitement et de l'electrodiagnostic de la dégénérescence nerveuse. *Archives d'Elect. Méd.*, 1916, xxiv., Oct., p. 358.

GEYSER, ALBERT C. The physics of the high frequency current. *N. Y. Med. Journ.*, 1916, civ., Nov. 4, p. 891.

A number of references to papers on Treatment are included in the Bibliography under individual diseases.

Indices

SUBJECT INDEX

Page References to Original Articles are indicated by Heavy Type Figures.

ABERRATION: National, or Emperor's Madness, **4**
Abscesses: from Shell Wound to Longitudinal Sinus, Recovery, **7**; Dementia and Multiple Brain, **135**; Fulminating Latent Cerebral, **449**; Otogenic Cerebral, **449**
Acids: Taste of, **375**
Acromegaly: **118**; Impairment and Loss of Sexual Power in, **119**
Addison's Disease: Traumatic, with Pigmentation of Skin after Bullet Wound in Suprarenal Region, **53**; Acute, with Recovery, **402**
Adrenal: *vide* Suprarenal
Adrenalin: Cure of Serous Apoplexy from Neosalvarsan by, **236**
Aerocele: Intra-cranial, **176**
Agitans, Paralysis: *vide* Paralysis Agitans
Alcoholism: **267**; Drink Problem of To-day (Review), **581**; Ethics and Law of, **127**; Hallucinoses, **134**
Alexia: and Verbal Amnesia, **261**
Amaurotic Family Idiocy: New Symptoms in, **257**
Amblyopia: Treatment of Functional, **195**; Psychology of Traumatic, following Explosion of Shells, **23**, **24**
Amyotrophy: Aran-Duchenne, Syphilitic, **513**
Anaphylaxis: Severe, in Tetanus after Preventive Inoculation, **234**
Anatomy: Studies in (Review), **275**; of Brain and Spinal Cord (Review), **324**
Aneurysm: of Femoral Artery with Cerebral Complications, **236**; of Right Internal Carotid Artery, **521**
Ankle Clonus: Pyramidal and Non-Pyramidal, **306**
Ankle-Jerk: Diagnostic Importance of, **307**; *vide* Reflexes
Aortitis: Syphilitic and Serology, **87**; Etiology of Syphilitic, **122**
Aphasia: Three Cases of Concussion, Treatment by General Anæsthesia, **25**; Transient, due to Arterial Spasm, **79**; Case of Verbal Amnesia, Alexia, and, **261**; Hughlings Jackson on, **261**; from Ligature of Right Common Carotid, **449**; Stock-Brainedness, Cause of Crossed, **562**
Aphonia: Functional, **25**, **26**, **208**
Appendix: Removal of, for Trifacial Neuralgia, **567**
Apraxia: Bilateral Motor, with Visual Disorientation, **201**
Arachnoid: Œdema, **174**
Art: in Insane, **577**
Arteries: of Pons and Medulla, **155**, **297**; *vide* Carotids
Arterio-Sclerosis: Dementia of Cerebral, **455**
Arthritis: Meningococcal, **225**; Subacute Form of Meningococcal, **225**
Arthropathy: Anæsthesia and Hyperthermia in Tabetic, **511**
Astereognosis: with Arachnoidal Œdema, **174**
Asthma: Pathology and Treatment of Nervous (Review), **191**
Asylums: as Military Hospitals, **223**
Ataxia: with Arachnoidal Œdema, **174**; Cerebellar, in Pertussis, **256**; **127** Cases of Paraplegic, **384**; Plantar Reflex in Acute, **474**
Athetosis: Speech in, **151**
Attitude: in "Wounded Neurotics," **461**
Auditory Nerve: *vide* Nerves, Cranial
Automatism: Medullary, **380**; after Muscular Effort, **380**
Azotæmia: in Typhoid Fever, **76**

BABINSKI'S SIGN: Comparative Anatomy of, **379**; *vide* Reflexes
Back Injuries: and their Significance (Review), **193**

Basedow's Disease: *vide* Exophthalmic Goitre
Bath: Dangers of Continuous, 138
Bed-Sores: (Review), 242
Beri-beri: and Malarial Polyneuritis, 89; Prophylaxis and Treatment, 239; Three Cases of, 317; Cerebral Lesions in Avitaminic Polyneuritis, 567
Blindness: Treatment of Functional, 195, 25; Congenital Word and Letter, 260; *vide* Amblyopia
Brain: *Anatomy*: (Review), 324; Endocranial Casts of, Criticism of Recent Speculations, 67; Roof Plate of Fore Brain in Human Embryo, 163; Regeneration in Forebrain of Amblyostoma, 250; Plains Indian, 372; of Identical Twins, 549
Physiology: Experimental Post-Natal Growth in Albino Rat, 68; Experimental Researches on Sensory Localisation in Cortex, 107
Pathology: Extreme Calcification with Mental Symptoms, 67; Focal and Unilateral Atrophy. Effects on Corpus Callosum, 243; Bilateral Lesions of Occipital Lobes with Retention of Macular Vision, 251; Lipoid of, as Hæmostatic, 96
Clinical: Shrapnel Injury to Right Parietal Cortex, 12; Bullet Wound of Left Posterior Central Convolution, 13; Traumatic Lesion of Right Frontal Lobe, 13; Focal Lesions of Left Angular Gyrus in Late Catatonia, 132; New Familial Infantile Form of Diffuse Sclerosis, 390; Visual Disturbances from Lesion of Cortical Visual Area, 448; *vide* Head, Tumour, &c.
Broncho-pneumonia: with Hemiplegia, 79

CALCIFICATION: Extreme, in Brain with Mental Symptoms, 67
Camptocormie: 460
Carbolic Acid: in Tetanus, 231
Carotid Arteries: Aphasia and Left Hemiplegia from Ligature of Right Common, 449; Cerebral Embolism from Gunshot Injury to, 449; Retrobulbar Neuritis and Aneurysm of Right Internal, 521
Casts: Endocranial, and Brain Form: Criticism of Recent Speculations, 67
Catatonia: Focal Lesions of Cortex of Left Angular Gyrus in Two Cases of Late, 132; in Manic-Depressive Insanity, 187; as Type of Mental Reaction, 322
Cauda Equina: Syndrome of Lesions of, from Gunshot Wounds, 15; Bullet Lesion of, 205
Causation: 274; of Certain Forms of Lunacy, 323
Cerebello-Pontine Angle: Tumour of, 389
Cerebellum: *Anatomy*: Fibrillary Neuroglia of Cortex, 162; Reactions of Cells of Purkinje, 303
Physiology: Localisation of Function in Canine, 164; Unusual Experimental Lesions of, 508
Pathology: Glioma with Metastases, 304
Clinical: Ataxia in Pertussis, 256; Vestibular Syndrome, 388; Hæmorrhage in Cerebro-Spinal Meningitis, 462; Hemiplegia, 562
Cerebro-Spinal Fever: *vide* Meningitis
Cerebro-Spinal Fluid: *Physiological*: Circulation of, 110; Possible Functions of, 525
Pathological: Typhoid and Paratyphoid Flora of, 43; Reducing Substance in Normal and Pathologic, 86; Trichina Larvæ in, 86, 318; Permanganate Reduction, Index of, 124; in Syndrome of Cervical Rheumatism with Sciatic Neuralgia, 268, 396; Urea Content of, 269; Syndromes of Norne and Froin, 396; Sugar Content in Insane, 525; Diagnostic Methods from, 526; Clinical Pathology of, 527; during Iodide Medication, 527
Clinical: When should it be examined in Syphilis, 85; In Paresis and Cerebro-Spinal Syphilis, 124; Drainage of, in Nervous Syphilis, 181; in Children, 395; in Latent Syphilis in Arabs, 394; Pregnancy complicated by increase of, 527
Colloidal Gold Test: in Paresis, 269
Cheiromegaly: in Familial Neurofibromatosis, 513
Chemical Sense: Existence of, in Vertebrates, 166; Taste of Acids, 375
Cholesterol: Content of Serum in Mental Disease, 134
Chorea: Etiology of, 399; Subcutaneous Magnesium Sulphate in, 400; Hysterical, of Diaphragm, 476; 226 Cases of, 529; Heredity and Eugenics in Huntingdon's, 566
Choroid Plexus: Morphology of, in Human Embryo, 163
Chromaphil Tissue: Active Principle of Retro-Peritoneal, has same Action as that of Supra-renals, 111
Coffee: on Spermatogenesis of Animals subjected to Cerebral Commotion, 476
Coli Bacillus: Septic Meningitis following Skull Wound, 12; with Meningococci in Meningitis, 77
Coma: from Cerebral Fat Embolism, 388
Concussion: *vide* "Shell-Shock"

Corpus Callosum: Effects of Focal and Unilateral Brain Atrophy on, 243
Corpus Striatum: Bilateral Lesion of, 520
Cortex, Cerebral; *vide* Brain
Cranial Nerves; *vide* Nerves, Cranial
Cretinism: Control of Experimental, 112
Criminal: Imbecile (Review), 140; Responsibility, 136; Unfitness to Plead in Trials, 576
Cyst: Multiple Visceral Hydatid, 79; "Status Epilepticus" and Death due to *Cysticercus*, 237; Calcified, of Cerebral Ependyma, 471; Circumscribed, of Leptomeninges, 558
Cysticercus cellulosæ: 79, 237; *vide* Cyst

DEAFNESS: Functional, from Bursting of Shell, 25
Delinquents: Proportion of Mental Defectives among, 188
Delirium Tremens: Gastric Mucosa in, 177
Delusions: Biological Significance of, 133
Dementia Paralytica: *vide* General Paralysis
Dementia Præcox: Salivary Factor and Relation to Dental Caries and Immunity in, 127; Characteristic Attitude in, 132; Factors in, 404; Cæcal Stasis in, 573
Diabetes Insipidus: Relation to Hypophysis, 119, 564
Diaphragm: Unilateral Paralysis of, with Alcoholic Polyneuritis, 89; Hysterical Chorea of, 476
Diet: Factor in Mental Disease, 322
Diphtheria: Transient Hemiplegia in, 145; Multiple Nuclear Paralysis with Meningeal Reaction in, 76; Clinical Symptoms of Nasal, and Nervous Complications of, 115; Prophylaxis of Paralysis, 253; Generalised Paralysis with Meningeal Reaction, 475
Disseminated Sclerosis: Long Period of Remission in, 1; Histology of, 285, 337, 541; with Bulbar Paralysis, 312; after Whooping-Cough, 313; Spastic Paraplegia for 15 years, 561
Diuresis: and Hypophysis, 119
Dreams: Meaning of (Review), 410; Problem (Review), 411
Drink: Problem (Review), 581
Drug Addiction: 183; Ethics and Law of, 127; Treatment of, 267
Dura Mater: Sarcoma of, 260
Dysentery: Peripheral Neuritis following Emetin Treatment of Amœbic, 568
Dyspituitarism: in Girl aged 15 years, 265; Case of, 521

ECTROMELUS: Longitudinal Radial, 563
Ear: Fulminating Meningitis, 43; Meningococcal and Pneumococcal Meningitis from Chronic Otorrhœa, 116; Warfare Neuroses of, 207; Cerebral Otogenic Abscess, 449
Education: Sequin and Physiological, 575
Electricity: Essentials of Medical (Review), 415; in Diagnosis and Treatment of Neurological Conditions, 96
Endocrine Organs: (Review), 139; Diseases of (Review), 534; Conditions of Activity in, 376; and Hibernation, 377; Phosphatides in, 552
Endophthalmitis: in Cerebro-spinal Meningitis, 226
Environment: in Mental Disease, 575
Embolism: Cerebral, Infantile Spinal Paralysis and Hemiplegia, 258; Cerebral Fat, with Delirium and Coma, 388; Cerebral, after Gunshot Injury to Carotids, 449
Encephalitis: Pertussis, 256
Encephalopathy: Malarial, 387
Epididymitis: in Cerebro-Spinal Meningitis, 38
Epilepsy: Clinical Studies in, 126, 397; Sensory Phenomena in, 126; After-Care Report following Colony Treatment, 126; Associated with Raynaud's Disease, 127; Salivary Factor and Relation to Dental Caries and Immunity in, 127; Blood Findings in, 182; Pathologic Constants in Idiopathic, 182; "Status Epilepticus" due to Cerebral Cysts of *Cysticercus*, 237; Desertion in Fugue, 237; Abnormal Relation between Liver and Brain Weights in 42 Cases, 320; Deterioration in, 398; 64 Cases of, 399; Continued Partial Traumatic, 447; Pathogenesis of, 528; Blood Cultures in, 528, 529
Erb-Duchenne Paralysis: from Injury to Fifth Cervical Nerve, 454
Eugenics: in Huntingdon's Chorea, 566
Eulenberg's Disease: 238
Exophthalmic Goitre: 530; Blood Changes in, 265; Acute, in Cerebro-Spinal Meningitis, 462
Exophthalmos: Experimental Attempts to Produce, 181; Post-mortem Findings in Long Standing, 402
Eye: *Experimental:* Changes in Rod-Visual Cells of Frog due to Light, 373; Migration of Retinal Pigment of *Planorbis*, 373
Clinical: Visual Disturbances from Lesions of Cerebral Optic Tracts and Cortical Visual Area, 448; *vide* Hemianopsia, Neuritis, Optic, &c.

FACIAL PHENOMENON: and Contralateral Sign, 556
Familial: Congenital Paramyotonia, 238
Fear: and Disease, 88
Feeble-minded: Intelligence of (Review), 578; *vide* Mental Defectives
Ferrivine: in Syphilis, 319
Fibroma: Extradural, compressing Cord, 74
Fibrositis: (Review), 192
Froin's Syndrome: Transitory in Parameningococcus Cerebro-Spinal Meningitis, 43; Significance of, 396; *vide* Xanthochromia
"Frost-Bite": *vide* Trench Feet
Fugue: Desertion in Epileptic, 237

GALACTOSIDES: of Brain, 250
Galyl: 1,000 Intravenous Injections of, 86
Galvanism: in "Shell Shock," 455
Ganglio-Neuroma: of Sympathetic, 303
Gasserian Ganglion: Injection of, Controlled by Fluoroscopy, 523
"Gassing": Optic Neuritis following, 54
General Paralysis: Somatic Characteristics of, 90; Proteolytic Ferments of Blood Serum in, 90; Onset of, 91; Correlation of Clinical and Serological Findings in, 124; Experimental Syphilis in Rabbit from Brain of Living Paretic, 129; Cultural Experiments with *Spirochæta pallida* from Paretic Brain, 130; Treatment by Salvarsanised Serum, 130; Treatment of, 270; in Federated Malay States, 274; Very Prolonged Mercurial Treatment in, 403; Nature of Dementia in, 403; from Histological Standpoint, 531; Strains of *Treponema pallidum* in, 555; in Rio de Janeiro, 571; Duration following Treatment, 572
Geniculate Ganglion: Symptomatology of, 298
Glioma: of Cerebellum with Metastases, 304
Goitre: Typhoid Inoculation and Endemic, 533
Graphites: Psychology of, 168
Graves' Disease: *vide* Exophthalmic Goitre
Growth: Experiments on, 166; of Body as affected by Feeding Ductless Glands, 378

HÆMORRHAGE: Diagnosis between Cerebral and Thrombotic Softening, 118; Ventricular Symptom Group, 175; Intracranial, no Symptoms of Compression, 259
Hallucinosis: in Manic-Depressive Psychoses, 91; Alcoholic, 134, 404; Chronic, 405
Head: Surgery of (Review), 241; Gunshot Wounds of, 7, 447; Treatment of Injuries of Warfare of, 8; Surgical Notes on Serious Injuries of, 10; Wounds of, 10; Treatment of Minor Gunshot Injuries of, 11; Acute Septic Meningitis due to *B. coli* following Skull Wound, 12; Radiography in Wounds of, 199; Removal of Intracranial Foreign Body under X-Rays, 199
Hemianopsia: Two Cases of Traumatic Double, with Partial Recovery, 11
Hemiatrophy: of Face with Recurrent Herpes Zoster, 72
Hemiparesis: of Palate, with Meningeal Syndrome, 173; with Ataxia and Astereognosis in Arachnoidal Œdema, 174
Hemiplegia: Transient, in Diphtheria, 145; Transient, from Arterial Spasm, 79; in Broncho-pneumonia, 79; from Cerebral Embolism, 258; Syncinesias of, 388; Left, from Injury to Right Common Carotid, 449; Cerebellar, 562; Infantile and Hereditary Syphilis, 562
Heredity: Zola's Study of, 406; in Huntingdon's Chorea, 566
Hermann-Perutz Reaction, 565
Herpes Zoster: and Paralysis of Arm, 72; Recurrent, of Face with Hemiatrophy, 72; Simulating Mastoiditis, with Multiple Symptoms, 171; with Varicella-like Spots, 383; Recurrens, 384; in Syphilitic Eruptions, 386
Hibernation: no change in Nervous System in Woodchuck during, 372; Ductless Glands and, 377; Theories of, 552
Hiccough: Intermittent, 254
Hexamine: in Aural Suppuration and Meningitis, 387
Huntingdon's Chorea: 566
Hydrocephalus: Unilateral, 257
Hydromyelia: 308
Hydrotherapeutics: for Soldiers, 479
Hygiene: State Hospital in Mental, 577
Hyperæsthesia: Signifies always Hyperalgesia, 383
Hypergenitalism: with Hypernephroma, 84
Hypernephroma: with Hypergenitalism, 84
Hyperpyrexia: Prolonged, with Mid-Brain Tumour in Child, 520
Hyperthermia: Local in Tabetic Arthropathy, 511
Hypnosis: Prolonged Pharmacological, for Cure of Some Psychoses, 95; in "Shell Shock," 457
Hypoglycæmia: and Progressive Muscular Dystrophy, 257
Hypophysis: *vide* Pituitary
Hysteria: in Border-Line Cases of Mental

Defect, 94; Tachypnœa in Soldier, 239; Psycho-Physiological Theory of, 266; Simulated Skin Disease in, 400; Chorea of Diaphragm, 476

IMBECILE: Criminal (Review), 140; Can they be Used in War? 479; *vide* Mental Defective
Inebriety: *vide* Alcoholism
Infantile Paralysis: *vide* Poliomyelitis
Infantilism: Pituitary, 522
Influenza: Meningitis, 78, 385; in Pregnancy, 527
Inosital: of Brain, Preparation, 250
Instinct: and Intelligence (Review), 101; Herd, in Peace and War (Review), 279
Insular Sclerosis: *vide* Disseminated Sclerosis
Intelligence: in Children and Feeble-minded (Review), 578; *vide* Instinct
Iridochoroiditis: Suppurative Meningococcal, Cured by Serum into Vitreous, 256
Intramine: in Syphilis, 319
Involuntary Nervous System: (Review), 325

JACKSON, HUGHLINGS: Papers on Aphasia and Speech, 261; Eye Observations of, 263
Jaundice: Sequel to Epidemic Catarrhal, 312
Joy: Influence of (Review), 539

LANGE COLLOIDAL GOLD TEST: *vide* Cerebro-Spinal Fluid
Laryngeal Nerve: Paralysis of Recurrent, in Mitral Stenosis, 185
Lead Poisoning: Two Cases from Unusual Sources, 119; Odour of Paint as Cause of, 317
Liminometer: Reflex, 70
Lipase: Regional Lipolytic Activity in Human Brain, 378
Lipodystrophy: Progressive, 258
Lipoid: Brain, as Hæmostatic, 96
Locomotor Ataxia: *vide* Tabes
Luargol: 394
Luetin Reaction: Potassium Iodide in, 397; in Syphilis, 523; in Infancy and Childhood, 524
Lying, Pathological: Accusation and Swindling (Review), 189; Case of, 406

MAGNESIUM SULPHATE: in Tetanus, 51; in Chorea, 400
Malaria: Polyneuritis and Beri-beri, 89; Optic Neuritis in Meningitis from Pernicious, 115; Larval, 254; Nervous Affections following, 254; Encephalopathy, 387
Malingering: Psychology of, 454
Manic-Depressive Psychoses: Study of Hallucinations in, 91; Catatonia in, 187; Pelvic Disease and, 532
Mastoiditis: Herpes Zoster Simulating, 171
Medulla Oblongata: Arteries of, 155, 297; Unusual Lesions of, 508
Melancholia: Acute, Treated by Blood-Letting, 92
Meningitis: *Cerebro-Spinal:* Cerebro-Spinal Fever (Review), 55; (Review), 482; in Royal Navy, 36; Epidemic, 36, 37, 38, 40, 230; and Sphenoidal Sinus, 38, 464; Necessity of Continuous Injections of Serum in Prolonged, 42; Commencing with Mental Disturbance, 77; Exanthem and Relapse in, 77; Mixed Infection with *B. coli*, 77; in Advanced Life, 116; Localised, of Base with Septicæmia, Recovery, 116; with Chronic Otorrhœa, 116; Twenty-four Hours after Abdominal Section, 117; Septicæmia of Intermittent Fever Type, Recovery, 223; Latent, 223; Hyperacute, no Cerebral Symptoms, 224; and Tuberculosis, 224; Treatment by Dorsal Puncture, 225; Arthritis and Epididymitis in, 38; Arthritis, Conjunctivitis and, 225; Subacute Pyarthrosis and, 225; Inclined Ventral Position in, 226; Congestion in, 226; Metastatic Endophthalmitis in, 226; Rapid Preparation of Serum in, 229; Chemical *v.* Serum Treatment, 230; Eleven Cases of, 255; Efficacy of Serum in, 255; After Fracture of Base of Skull, 255; Cardio-Vascular and Mental Symptoms in Adult, 461; Severe Prolonged, 462; Cerebellar Hæmorrhage and Acute Graves' Disease in, 462; Purpura Fulminans Septicæmia, 463; Treatment of, 463; Disinfection of Carriers, 464; Problem of Carriers, 465; Treatment of, 520
Coli: Acute, from Skull Wound, 12
Influenzal: 78, 385
Parameningococcal: and Mumps, 43
Pneumococcal: with Chronic Otorrhœa, 116; After Fracture of Base of Skull, 255; Recovery following Vaccine Therapy, 385; Treatment of, 520
Serosa: 117
Staphylococcal: and Septicæmia, 386
Syphilitic: Zosteriform Eruptions in, 386
Tetragenous: Two Cases of, 42
Tuberculous: Diagnosis of So-Called Primary, 78; Experimental, 386; and Calcified Cyst of Ependyma, 471

Typhoid: Acute Primary, due to Paratyphoid A, 42, 227; with Flora of Cerebro-Spinal Fluid, 43; Meningeal Syndrome and Azotæmia in, 76; Serous, 227; Epidemic, due to Paratyphoid B, 228; Subacute Septicæmia, 228
General: Suppurative, from Thrombophlebitis of Longitudinal Sinus, 7; Fulminating Otogenic, 43; in Mumps, 78, 228, 471; and Multiple Nuclear Diphtheritic Paralysis, 76; Optic Neuritis from Pernicious Malarial Fever in, 115; Meningeal Syndrome during Attack of Varicella, 173; Hexamine in, 387
Meningococcus: Tenacity of, 38; in Peripheral Blood Films in Meningitis, 39; Classification of, by Group Agglutination, 39; Grouping of Strains in 1915 Epidemic, 40; Pleomorphism of, 41; in Etiology of Cerebro-Spinal Fever, 230; Identification in Naso-Pharynx, 465; in Naso-Pharynx and Spinal Fluid, 465; Etiology of, 466, 469; Bacteriology of, 466; Changes in Agglutinability in Acute Attack, 467; Culture of, 468; Life-History of, 469
Menopause: Early, in Virgins, 181; Vasomotor Disturbances of, 570
Mental Deficiency Act: 407
Mental Defective: Mental Deficient Children (Review), 333; Child (Review), 537; Intelligence of (Review), 578; in War, their Utilisation, 54, 479; Mental Disturbances in, 92; Border-Line Case and Hysterical Symptoms, 94; What becomes of Children who pass out of Special Classes? 168; Speech Disorder in, 173; Proportion of, among Delinquents, 188; Relative Degrees of Dullness and Backwardness in School Children, 274; High Grade, 407
Meralgia Paræsthetica: 477
Mercurialised Serum: Intraspinal Treatment of Syphilis of Nervous System by, 121; Intraspinal, in Spastic Paraplegia, 180; in General Paralysis, 403
Metabolism: in Myasthenia Gravis, 320; *vide* Diet
Mitral Stenosis: Paralysis of Recurrent Laryngeal Nerve in, 185
Mongolian: Brain of Imbecile, 252
Motives: Human (Review), 538
Mumps: and Parameningococcus Cerebro-Spinal Meningitis, 43; Bilateral Paralysis of Brachial Plexus of Upper Root Type in, 52; Meningitis from, in Child, 78; Fatal Meningitis in, 228; Statistics of Meningeal Reaction in 243 Soldiers, 471
Murder: Unique Case, New Law for Expert Testimony, 271
Muscle: Postural Activity of, 164; Tonus, 165; Changes in, after Nerve Section, 300; Direct Neurotization of Paralysed, 550
Musculo-Spiral Nerve: Sensory Loss in Paresis of, 453
Myasthenia Gravis: Metabolism, 320; with Thymoma, 522
Myelin: in reducing Water Content of Rat's Nervous System, 373
Myosthenometer: Clinical, 70
Myotonia Congenita: *vide* Thomsen's Disease
Mystic: Modern, 69
Myxœdema: with Sclerodermia while under Thyroid Treatment, 89

NROSALVARSAN: Tabes treated with Intraspinal Subdural Injections of, Death, 75; Serous Apoplexy from, cured by Milian's Adrenalin Method, 236; Bactericidal Power of Serum after, 268
Nephritis: Syphilitic, and Salvarsan, 87, 180
Nerve-Cells: Absence of Chromatolysis during Hibernation in, 372; Organic Depression by Prolonged Ether Anæsthesia, 379; Activity on Structure of, 505
Nerve-Endings: Observations on, 111
Nerve-Fibres: *Experimental:* Transplantation of Peripheral, 109; Postural Activity of, 164; Unmyelinated, as Conductors of Protopathic Sensation, 171; Change in Muscle after Section of, 300; Function of Medullary Sheath, 301
Clinical: Wounds of (Review), 479; Clinical Forms of Lesions of (Review), 479; Injuries and Treatment (Review), 481; Wounds of, 16; Suture for Bullet Wounds, 17; Sleeve of Vein in Suture of, 20; Treatment of Gunshot Injuries of, 17, 18, 19; Syndrome of Compression, 206; Clinical Individuality of Peripheral, 451; War Injuries of, 452, 453; Sensory Loss in Musculo-Spiral Paresis, 453; Erb-Duchenne Paralysis, 454; Cutaneous Sensation after Division, 506
Nerves, Cranial: Structure of Third, Fourth, Fifth, Sixth, Ninth, Eleventh, and Twelfth, 506
Oculomotor: Paralysis of, at Onset of Paratyphoid A, 235
Trigeminal: Bilateral Complete Paralysis of, 311
Facial: Peripheral Neuritis of, 71; Sensory Field of, 298; Painful Neuralgia with Paralysis in Tertiary Syphilis, 318; Contralateral Facial Sign, 556

Cochlear: Neuritis of, from Exposure to Cold, 129
Vagus: Experimental Study of, 374; Oculo-Cardiac Reflex in Lesions of, 557
Neuralgia: Sciatic, and Cervical Rheumatism, Diagnosis from Meningitis, 229; Cerebro-Spinal Fluid in Cervical Rheumatism with Sciatic, 268, 396; Scarlatinal, 238; Removal of Appendix from Trifacial, 567
Neurasthenia: Gastrica, 128; Treatment of, 401
Neuritis: *Optic:* following "Gassing," 54; in Meningitis from Pernicious Malaria, 115; Severe in Pertussis, 256; Retrobulbar in Expanding Lesions of Frontal Lobes, 521
General: Chronic Progressive after Fracture of Elbow Joint, 71; of Cochlear Nerve from Cold, 129; in Pregnancy, 266; Gluteal Fold in Sciatic, 401; Peripheral, following Emetin for Amœbic Dysentery, 568
Neurofibromatosis: General, with Anomalies of the Visual Apparatus, Intelligence, and Skeleton, 53; Recklinghausen's Disease, 73; Central Peripheral, 73; Familial, with Unilateral Cheiromegaly, 513
Neuroglia: Fibrillary, of Cerebellar Cortex, 162
Neuroses: of War, 20-26, 207-223, 454-461; *vide* "Shell Shock"
Nipple: Sensibility of, in Mental Disease, 272
Nucleinate of Soda: in Acute Mental Disorders, 274
Nursing: and Care of Nervous and Insane (Review), 100
Nystagmus: Discussion on, 184; and allied Conditions, 184

Obesity: Epileptiform Attacks and Recurrent Jaundice in Girl, 265
Obituary: Sir Victor Horsley, 583
Obstetrical Paralysis: 258
Oculo-Cardiac Reflex: in Traumatic Lesions of Vagi, 557
Orchitis: in Mumps in Soldiers, 471
Otitis Media: Acute, 561; *vide* Ear
Overactivity: as Potent Factor in Etiology of Nervous Diseases, 112
Oxycephaly: Cranial Deformity of, 310

Pachymeningitis: Hypertrophic Cervical. Syphilis, 256
Paralysis Agitans: Treatment with Parathyroid, 402
Paraplegia: 127 Cases of Ataxic, 384; of 15 Years' Duration, 561
Paramyotonia: Congenital Familial, 238
Parathyroid: in Paralysis Agitans, 402
Parathyroid: *vide* Typhoid
Pellagra: Sanitation and Control of, 120; *B. Welchii* in Stools in, 178; Causation and Prevention, 179; Diet in Etiology of, 391; Subsequent History of, after Initial Attack, 392; Vitamin Deficiency in, 564; Cerebral Lesions in Avitaminic Polyneuritis, 567
Perithelioma: of Hypophysis, 554
Permanganate Reduction Index: of Cerebro-Spinal Fluid, 124
Personality: Loss of, from "Shell Shock," 20
Pertussis: Severe Optic Neuritis and Cerebellar Ataxia in, 256; with Multiple Sclerosis, 313
Physiology: Human (Review), 277
Pineal Body: Tumour of, 82; Experimental and Clinical, 315; Growth of Body of Rat by Feeding with, 378; Studies on, 509; Hyperplasia of, 553; Composition and Physiological Activity of, 550
Pituitary: *Experimental:* Action of Extract on Diuresis, Blood-Pressure, and Nitrogen Excretion, 119; Pressor Substance in Fœtal, 250; Changes in Thyroid from Extract of, 302; Growth of Body of Rat by Feeding with, 378;
Clinical: and Diabetes Insipidus, 119; Dyspituitarism in Girl of 15 Years, 265; Surgical Approach to, 314; Atrophy of Thyroid with Hypertrophy of, 402; Dystrophy, 521; Infantilism, 522; *vide* Tumour
Plumbism: *vide* Lead-Poisoning
Pneumococcus: Meningitis, 116, 255, 385, 520
Poliomyelitis Anterior Acuta: *Pathology:* Microbic Cause and Manner of Infection of, 69; Laboratory Aids in, 518; Etiology of, 518, 519
Clinical: Serum Disease after Injection of Human Serum into the Spinal Canal, 75; Second Attack after Three Years, 384; Paralysis of, 385; Acute Relapsing, Recovery, 475; Nature, Conveyance, and Prevention, 513; Acute, 514; Abortive, 515; Present Epidemic, 515, 516; Serum Treatment of, 516; Immune Human Serum in, 517; Acute Stage of, 517; Prolonged Treatment in, 517; Orthopædics in, 518; Fatal Case in Adult, 559; Immune Serum in, 559
Polyneuritis: Alcoholic, with Unilateral Diaphragmatic and Laryngeal Paralysis, 89; Malarial and Beri-beri, 89; Exaggeration of Reflexes in, 254; Cerebral Lesions in Avitaminic, 567

Pons Varolii: Arteries of, 155, 297; Tumours of, 313
Pregnancy: Neuritis in, 266; and increased Cerebro-Spinal Pressure, 527
Progressive Lenticular Degeneration, 391; Family Form of Pseudo-Sclerosis and, 176
Progressive Macular Degeneration, 570
Progressive Muscular Atrophy: Speech in, 172; Hypoglycæmia and, 257
Protopathic Sensation: Unmyelinated Nerve-fibres as Conductors of, 171
Pseudo-Hypertrophic Muscular Dystrophy: with Amentia, 114
Pseudologica Phantastica: Case of, 406
Pseudo-Sclerosis: Family Form of, 176
Psycho-Analysis: Theory of (Review), 98
Psychograph: of Rossolimo, 577
Psychology: Introduction to Social (Review), 141; Elementary Text-Book of (Review), 328; Collected Papers on Analytical (Review), 412; of Relaxation (Review), 580; of Graphites, 168; of Tuberculous, 251; of Rumour, 302; Developmental, 321
Psychopathology: Scope of, 408; of War Neuroses, 456
Psychopathy: Mental Examination in, 187; Hospitals and Prophylaxis, 188; Sensory Threshold for Faradic Stimulation in, 188
Psychoses: Study of Benign, 91; Prolonged Pharmacological Hypnosis in Cure of Some, 95; Pathology of Sympathetic System in, 273
Purkinje-Cells: Reactions of, 303

RABIES: Paralysis during Antirabic Treatment, 309
Radiculitis, 400
Rat (Review), 276; Post-natal Growth of Brain under Experimental Conditions in Albino, 68; Growth of Body by Feeding with Ductless Glands, 378
Raynaud's Disease: with Epilepsy, 127; Cerebral Symptoms of, 569
Reaction-Time: in Nervous and Mental Disease, 575
Reflexes: Meaning of Adductor Responses of Leg, 170; Mid-Plantar, 305; Dissociation of Tendon Achillis and Mid-Plantar, 306; Cutaneous Plantar, in Dorsal and Ventral Position in Pyramidal Lesions, 307; Laminectomy and Simple Exposure of Cord on, 307; Falling, of Cats, 374; Babinski's Sign for Comparative Anatomy, 379; "Medullary Automatism," 380; Achilles, 381; "Sign of Sterno-Mastoid," 382; Crossed Hip, in Enteric, 382; Defence and Muscle, in Spinal Localisation, 382; Plantar, in Acute Ataxia, varies with Position, 474; Variations in Tendon, only Sign of Severe Asthenia, 475; Superior Radio-Pronator, 556; Nervous Disturbances of Reflex Origin, 557; Oculo-Cardiac, 557
Relaxation: Psychology of (Review), 580
Religion: New Method in Psychology of, 169
Reviews: (T. J. Horder) Cerebro-Spinal Fever, 55; (Wilfred Harris) Nerve Injuries and Shock, 56; (E. Tanzi and E. Lugaro) Text-Book of Mental Diseases, 97; (C. G. Jung) Theory of Psycho-analysis, 98; (C. K. Mills) Nursing and Care of Nervous and Insane, 100; (N. C. MacNamara) Instinct and Intelligence, 101; (J. B. Hurry) Vicious Circles in Sociology and their Treatment, 102; Reports of the Clinical Conferences of the Neurological Institute of New York, 102; (Sir E. A. Schäfer) Endocrine Organs, 139; (H. H. Goddard) Criminal Imbecile, 140; (Wm. M'Dougall) Introduction to Social Psychology, 141; (E. M. Smith) Investigation of Mind in Animals, 143; (J. V. May, A. Hoch, and G. H. Kirkby) Psychiatric Bulletin, 144; (Wm. Healy and M. T. Healy) Pathological Lying, Accusation and Swindling, 189; (J. B. Berkart) Pathology and Treatment of So-Called Nervous Asthma, 191; (Ll. J. Llewellyn and A. B. Jones) Fibrositis, 192; (A. M'Kendrick) Back Injuries and their Significance, 193; (L. B. Rawling) Surgery of the Head, 241; (T. H. Goodwin) Field Service Notes for R.A.M.C., 241; (C. W. Smart) Bed-Sores, their Prevention and Cure, 242; (P. Thompson) Studies in Anatomy, 275; (H. H. Donaldson) Rat, 276; (L. Luciani) Human Physiology, 277; (W. Trotter) Instincts of Herd, in Peace and War, 279; (R. Bing) Text-Book of Nervous Diseases, 281; (C. L. Dana) Text-Book of Nervous Diseases, 282; (H. Zinsser, J. G. Hopkins, and R. Ottenberg) Laboratory Course in Serum Study, 284; (H. E. Santee) Anatomy of Brain and Spinal Cord, 324; (W. H. Gaskell) Involuntary Nervous System, 325; (W. H. Spikes) Elementary Text-Book of Psychology, 328; (J. L. Stoddard and E. C. Cutler) Torula Infection in Man, 329; (L. Krehl) Basis of Symptoms, 331; (G. E. Shuttleworth and W. A. Potts) Mentally Deficient Children, 333; (J. E. R. M'Donagh) Links in Chain of Research on Syphilis, 334; (E. L. Ash) Stammering and Suc-

cessful Control in Speech and Action, 335; (R. Wallace) Nervous Disorders of Modern Life, 336; (H. M. Hurd, &c.) Institutional Care of Insane in United States and Canada, 409; (I. H. Coriat) Meaning of Dreams, 410; (A. E. Maeder) Dream Problem, 411; (C. J. Jung) Collected Papers on Analytical Psychology, 412; (W. B. Bell) Sex Complex, 413; (E. R. Morton) Essentials of Medical Electricity, 415; (W. C. Bosanquet and J. W. H. Eyre) Serums, Vaccines, and Toxins, 415; (S. Weir Mitchell) Memorial Addresses and Resolutions, 416; (J. Tinel) Wounds of Nerves, 479; (Athanassio-Bénisty) Clinical Forms of Nerve Lesions, 479; (P. Stewart and A. Evans) Nerve Injuries and their Treatment, 481; (M. Foster and J. F. Gaskell) Cerebro-Spinal Fever, 482; (M. Courtois-Suffit and R. Giroux) Abnormal Forms of Tetanus, 484; (P. Stewart) Diagnosis of Nervous Diseases, 533; (W. Falta) Ductless Glandular Diseases, 534; (J. R. de Fursac and A. J. Rosanoff) Manual of Psychiatry, 536; (M. Young) Mentally Defective Child, 537: (J. J. Putnam) Human Motive, 538; (H. A. Bruce) Sleep and Sleeplessness, 538; (G. v. N. Dearborn) Influence of Joy, 539; (A. Binet and Th. Simon) Development of Intelligence in Children, 578; (A. Binet and Th. Simon) Intelligence of Feeble-Minded, 578; (G. T. W. Patrick) Psychology of Relaxation, 580; (T. N. Kelynack) Drink Problem of To-day, 581

Rhapsodieen: Reil's Critical Review, 186

Rheumatism: Cervical and Sciatic Neuralgia. Diagnosis from Meningitis, 229, 268, 396; Cerebral, 311; Experimental, in Rabbits, 556

Rossolimo; Psychograph of, 577

Rumour: Psychology of, 302

SALVARSAN: in Syphilitic Nephritis, 87; Bactericidal Power acquired by Serum after, 268; Onset of Severe Nervous Symptoms after, 392; in Syphilis, 393; Syphilis of Eye following, 478; in Tuberculosis and Syphilis, 566

Salvarsanized Serum: 130, 271, 393, 572; *in vitro*, 394

Sarcoma: of Dura Mater, 260; of Frontal Lobe, 314

Sciatica: and Cervical Rheumatism. Diagnosis from Meningitis, 229, 268, 396

Sclerodermia: in Myxœdema while under Thyroid Treatment, 89

Sequin: and Physiological Education, 575

Sex Complex: (Review), 413

Semicircular Canals: Unilateral Destruction in Cats, 374

Sensation: Cutaneous after Nerve Division, 506

Sensibility: Farado-Cutaneous Painful, 383

Serum: (Review), 415; Albumin and Globulin Content of Human, 524

Shakespeare: Mad Folk in, 531

Shame: 553

"Shell Shock": Nerve Injuries and Shock (Review), 56; Loss of Personality from, 20; Functional Nerve Disease and, 21; Paresis and Involuntary Movements from, 26; Neuroses of Throat and Ear, 207; Treatment by General Anæsthesia, 208; Peripheral Shock and Central Effects, 209; Nature and Treatment of, 209; Soldier and, 210; Discussion on, 213; Effect of High Explosives on Central Nervous System, 216, 219; Mental Conditions following, 220, 221, 222; Psychology of, 454; Etiology of, 455; Treatment by Cerebro-Spinal Galvanism, 455; Psycho-Pathology of, 456; Hypnotism in, 457; from Bursting of High Explosives, 457, 458; Tremors and Emotional States, 459, 460; Coffee and Veronal Intoxication on Spermatogenesis in Commotion, 476; *vide* Amblyopia, Aphonia, &c.

Sinus, Superior Longitudinal: Injuries to, 5, 200; Thrombophlebitis of, Operation, Recovery, 7

Skull: *vide* Head

Sleep: and Sleeplessness (Review), 538

Spasm: Arterial, causing Transient Aphasia, Hemiplegia, and Hemiparesis, 79

Speech Disorder: in Athetosis, 151; in Progressive Muscular Atrophy, 172; in Mental Defectives, 173; in Public Schools, 321; Following Adenoid and Tonsil Operations, 321; Common, of Childhood, 530

Sphenoidal Sinus: in Cerebro-Spinal Fever, 38, 464

Spina Bifida: Causation of, 253

Spinal Cord: *Anatomy:* (Review), 324

Pathology: Finer Histological Changes in Traumatic Degenerations following Bullet Wounds, or Shock to Vertebral Column, 417

Clinical: Injuries of Warfare, 13; Extradural Fibroma compressing Cord, 74; Gunshot Wounds of, 202; Laminectomy, Effects on Reflexes and Symptoms, 307; Vertebral Trauma and Lesion of Lower End of, 308; Importance of

Defence and Muscle Reflexes in Localisation, 382; Gunshot Wounds of, 450; Post-Traumatic Curable Sclerosis, 511; *vide* Cauda Equina, &c.
Spine: Fracture of, 558
Stammering: and Control in Speech and Action (Review), 335
Status Epilepticus: due to Cerebral Cysts of Cysticercus, 237
Sterno-Mastoid: Sign of, Bulbo-Medullary Irritation, 382
Stuttering: Speech Conflict in Cities in Etiology of, 200 Cases, 172
Suprarenal Glands: Extract of Retro-Peritoneal Chromaphil Tissue has same Action as that of, 111; Involutional Changes in Cortex during Infancy, 300; Influence of Emotional Disturbances on, 551
Suture: of Nerves, 17; Sleeve of Vein in Nerve, 20
Symbolism, 169
Symphalangism, 317
Sympathetic System: Pathology of, in Psychoses, 273
Sympathetic Ganglia in Exophthalmic Goitre, 554
Symptoms: Basis of (Review), 331
Syncinesia: of Hemiplegics, 388
Syphilis: Links in chain of Research on (Review), 334; When should Cerebro-Spinal Fluid be Examined in? 85; Nephritis and Salvarsan, 87; Aortitis, 87, 122; with Early Involvement of Nerve Centres, 88; Reactions and Results of Treatment in Cerebro-Spinal, 120; Intraspinal Treatment of, of Central Nervous System, 120; Intraspinal Mercurialised Serum in, 121; of Vertebræ, 179; Drainage of Cerebro-Spinal Fluid in Treatment of Nervous, 181; Painful Facial Neuralgia in Tertiary, 318; Ferrivine and Intramine in, 319; Early Onset of Nervous Symptoms after "606," 392; Latent, in Arabs, 394; during War, 478; of Eye following Salvarsan, 478; Hereditary, 523; Hereditary, and Infantile Hemiplegia, 562; Hermann-Perutz in, 565; Treatment of Cerebro-Spinal, 573; in East Louisiana Hospital, 573; *vide* Salvarsan, Luetin, &c.
Treponema pallidum: Spirochæticidal Antibodies against, 122; Individual Fluctuations in Comparative Virulence of Strains passed through Rabbits, 123; Difference in Behaviour of Immune Serum between Cultivated Non-Virulent, and Virulent from Lesions, 123; Strains of, in Brains from Paretics, 555
Tabes: treated with Intraspinal Subdural Injections of Neosalvarsan, Death, 75; Proteolytic Ferments of Blood Serum in, 90; Needless Surgical Operations from Failure to Recognise, 114; Treatment of, by Salvarsanised Serum, 130; Voice Sign in, 172; Study of 250 Cases, 309; Anæsthesia and Local Hyperthermia in Arthropathy, 511; Ocular Crises in, 560
Tachypnœa: Hysterical, in Soldier, 239
"Tetanism": so-called, 128
Tetanus: 44-51, 231-235, 471-474; Abnormal Forms of (Review), 484; Analysis of, in Home Military Hospitals from Aug. 1914 to Aug. 1915, 44; and from 1st Aug. 1915 to 31st July 1916, 471; Prophylaxis of, 45; Acute, 46, 46, 47, 47, 47; Late, 48, 48, 48, 49, 232, 234, 234; Relapse of, 50; Chronic Recurrent, 233; General, following Local Tetanic Spasms of Injured Limb, 233; Pseudo-Tetanic Symptoms, 45; Spasm localised to Wounded Limb, 46; Partial, of Limbs with Early Onset, 472; Abdomino-Thoracic Type, 473; Mental Symptoms in Acute, during Treatment by Carbolic Injections, 231; Intra-Cerebral Injection in, 47; Anti-Tetanic Serum in, 49, 232; Injection of Oxygen in, 50; Colloidal Iodine in, 50; Iodine in, 235; Magnesium Sulphate in, 51; Presence of Bacillus on Surface of Projectiles enclosed within Cicatrised Wounds, 473; Absence of Toxin of, in Cerebro-Spinal Fluid in, 474; Severe Anaphylaxis in, 234
Tetany: Infantile, 90
Tethelin: 166, 168
Thomsen's Disease: In a Child, 113; Changes in Muscular Contraction in, 512
Throat: Warfare Neuroses of, 207
Thrombosis: Diagnosis between Cerebral Hæmorrhage and, 118; of Cerebral Arteries in Paratyphoid B, 235, 477
Thrombo-Angiitis Obliterans: 568
Thymoma: Myasthenia Gravis with, 522
Thyroid: Changes in, from Pituitary Extract, 302; Atrophy of, with Hypertrophy of Pituitary, 402; *vide* Exophthalmic Goitre
Tonus: Muscle, 165
Torula: Infection in Man (Review), 329
Tremors: and Emotional States, 459; following Explosions, 459; *vide* "Shell Shock"
Trench-Feet: 26, 28, 30, 30, 31, 32, 33, 223; Prevention of, 29; Treatment of Painful, 33; Electrical Treatment of, 34; Pathology of, 34

Trichinosis: Larvæ in Spinal Fluid, 86, 318, 318
Tuberculosis: Meningitis, Primary, 78; and Meningococcal Meningitis, 224; Psychology of, 251; Wassermann Reaction in, 396; Salvarsan in Syphilis and, 566
Tumour: *Cerebellar:* of Pontine Angle, 389
Cerebral: Anatomical Location and Histopathology of Ninety-nine, 485; of Temporal Lobe, 80; Dermoid? 200; of Centrum Ovale of Right Prefrontal Lobe, 259; of Dura Mater, 260; Pontine, 313; Sarcoma of Frontal Lobe with only Ocular Signs, 314
Röentgenography in, 100, 563; Prolonged Hyperpyrexia in Child with Mid-Brain, 520; Retrobulbar Neuritis in Lesions of Frontal Lobes, 521
Pineal: 82; Hyperplasia of, 553
Pituitary: Distortion of Visual Fields in, 81; Cranio-Pharyngeal Duct, 175; Perithelioma of, 554; Peculiar Finding in Posterior Lobe, 564; with Infantilism, 522
Spinal: Extra-Dural Fibroma, 74; Case of, 559
Twins: Brain in Identical, 549
Typhoid: and Paratyphoid Flora of Cerebro-Spinal Fluid, 43; Meningeal Syndrome and Azotæmia in, 76; Anti-typhoid Inoculation in Mental Disease, 136; Serous Meningitis, 227; Subacute Septicæmia with Meningeal Signs, 228; Crossed Hip Reflex in, 382; Inoculation on Endemic Goitre in Punjab Asylum, 533
Paratyphoid A: Acute Primary Cerebro-Spinal Meningitis due to, 42, 227; Paralysis of Oculo-Motor at Onset of, 235; Psychical Complications of, 477
Paratyphoid B: Epidemic of Meningeal Form of, 228; Thrombosis of Cerebral Arteries in, 235, 477
Typhus Fever: Nervous Complications of, 173

ULNAR NERVE: Late Paralysis of, Form of Chronic Progressive Neuritis after Fracture of Elbow Joint, 71; Selective Sensory Regeneration in Lesion of, 114
Urea: Content of Cerebro-Spinal Fluid, 269

VARICELLA: Meningeal Syndrome in Child during, 173; Herpes Zoster with, 383
Veronal: Intoxication on Spermatogenesis, 476
Vicious Circles: in Sociology and Their Treatment (Review), 102
Voice: Possibility of Inheritance, 103

WAR: Neurology of, 1-56; 195-242; 417-484
Wassermann Reaction: in Paresis and Cerebro-Spinal Syphilis, 124; Dry Permanent Standards in, 125; in Psychiatry, 273; in Tuberculosis, 396; applied in Large Numbers, 478; in Infancy and Childhood, 524; Albumin and Globulin Content of Human Serum, 524; Methods of, 565; in Amentia, 100 Cases, 566
Whooping-Cough: *vide* Pertussis
Winking: Cortical Centre for, 512

X-RAYS: In Diagnosis and Treatment, 96; in Gunshot Wounds of Skull, 199; Removal of Intracranial Foreign Body under, 199; in Localisation of Brain Tumours, 563

INDEX TO AUTHORS

Page References to Original Articles are indicated by Heavy Type Figures.

ABERCROMBIE, R. G. Treatment of Tetanus, with Special Reference to Antitetanus Serum and Local Treatment of Wound, **232**

Abt, I. A., and Levinson, A. Study of Two Hundred and Twenty-six Cases of Chorea, **529**

Abundo, G. d'. Reflex Synkinesis of Orbicularis Palpebrarum in Contracture from Peripheral Neuritis of VII., **71**; Changes in Central Nervous System following Special Traumatic Disturbances, **219**

Adami, J. D. Life History of Meningococcus and other Bacteria, **469**

Adams, David Rutherford. Case of Ganglio-Neuroma of Sympathetic, **303**

Adams, J. Barfield. Zola's Study of Heredity, **406**

Adamson, H. G. Herpes Recurrens, **384**

Ager, Louis C. Present Epidemic of Poliomyelitis—Type which it Presents, **515**

Alford, Henry J. Note on Case of Cerebro-Spinal Meningitis: Tenacity of Meningococcus, **38**

Alves, E. R. Severe Case of Syphilis with Very Early Involvement of Nerve Centres, **88**

Amoss, Harold A., and Flexner, Simon. Chemical *versus* Serum Treatment of Epidemic Meningitis, **230**

Amoss, Harold A., and Wollstein, Martha. Method for Rapid Preparation of Anti-Meningitis Serum, **229**

Anderson, H. M., and Noel, H. L. C. Case of Shrapnel Injury to Right Parietal Cortex, **12**

Aretini, Ascanio. General Histopathology of Fibrillary Neuroglia of Cerebellar Cortex, **162**; Observations on Reaction of Protoplasmic Prolongations of Cells of Purkinje, **303**

Arey, Leslie B. Influence of Light and Temperature upon Migration of Retinal Pigment of *Planorbis trivolvis*, **373**; Changes in Rod Visual Cells of Frog due to Action of Light, **373**

Arkwright, Joseph A. Grouping of Strains of Meningococcus Isolated during Epidemic of Cerebro-Spinal Meningitis in 1915, **40**

Armour, Donald. Gunshot Wounds of Spine: Their Surgical Aspect, **450**

Ash, Edwin L. Stammering and Successful Control in Speech and Action (Review), **335**

Assinder, E. W., and Evans, J. J. Pathological Report on Case of Pituitary Infantilism, **522**

Astwazaturof. Babinski's Sign from Point of View of Comparative Anatomy, **379**

Athanassio-Benisty, Mme. Clinical Forms of Nerve Lesions (Review), **479**

Athanassio-Benisty, Mme., and Marie, Pierre. Clinical Individuality of Peripheral Nerves, **451**

Auer, E. Murray. Sensory Phenomena in Epilepsy, **126**

Auregan. Colloidal Iodine associated with Serum Treatment in Tetanus, **50**

Austin, R. S., and Churchill, F. S. Frequency of Hereditary Syphilis, **523**

Austregesilo, A., and Ayres, O. Complex Case with Cerebellar and Vestibular Syndromes, **388**

Austrian, C. R. Experimental Tuberculous Meningitis, **386**

Ayres, O., and Austregesilo, A. Complex Case with Cerebellar and Vestibular Syndromes, **388**

BABINSKI, J. Nerve Lesions by Wounds of War, **452**

Babinski, J., and Froment, J. Nervous Disturbances of Reflex Origin, **557**

Babonneix, L. Infantile Hemiplegia and Hereditary Syphilis, **562**

Bailey, Pearce, and Elsberg, Charles E. Laminectomy with Simple Exposure of Spinal Cord: Effects on Reflexes and on Symptoms of Spinal Disease, **307**

Bailey, Percival. Morphology of Roof Plate of Fore-Brain and Lateral Choroid Plexuses in Human Embryo, **163**

Balfour, Donald C. Foreign Bodies Swallowed by Insane Woman, **136**

Ballet, B., and Job, E. Nervous Complications of Typhus Fever, 173
Ballet, Gilbert. Chronic Hallucinoses, 405; Relation of Tremors and Emotional States, 459
Barber, C. H., and Scott, Norman. Case of Severe Tetanus; Recovery after Intra-Cerebral Injection, 47
Barenne, J. G. D. de. Experimental Researches on Sensory Localisations in Cerebral Cortex, 107
Barré, J. A., and Guillain, G. Paralysis of Oculomotor Nerve at Onset of Paratyphoid A, 235; Ankle-Clonus, Pyramidal Clonus and Non-Pyramidal Clonus, 306; Different Behaviour of Cutaneous Plantar Reflex Examined in Dorsal and Ventral Position in Certain Cases of Pyramidal Lesions, 307; Organic Pyramidal Lesions following Explosion of Projectile without External Wound, 458; Plantar Reflex in Acute Ataxia, Different State of Reflex according to Patient's Position, 474
Barré, J. A., Guillain, G., and Chauffard. Mid-Plantar Reflex, 305
Barré, J. A., Guillain, G., and Strohl, A. Clinical Dissociation of Modifications in Tendo-Achilles Reflex and Mid-Plantar Reflex, 306
Basinger, H. Raymond. Control of Experimental Cretinism, 112
Bass, Murray H. Treatment of Acute Stage of Anterior Poliomyelitis, 517
Bassoe, Peter. Two Successfully Operated Cases of Extra-Dural Fibroma Compressing Cord, 74
Bassoe, Peter, and Nuzam, Frank. Case of Central Peripheral Neurofibromatosis, 73
Batten, Frederick E. Epidemic Cerebro-Spinal Meningitis, 38; Some Functional Nervous Affections produced by the War, 209
Bauch, Solomon. Psychology of Tuberculous, 251
Baudouin, Souques, and Lantuéjoul. Two Cases of Aran-Duchenne Amyotrophy of Syphilitic Origin, 513
Baur, J., Sevestre, J., and Hutinel, J. Mild Meningococcal Septicæmia of Intermittent Fever Type following Cerebro-Spinal Meningitis. Recovery, 223
Beckley, Chester C. Border-Line Cases of Mental Defect, with Special Reference to Hysterical Symptoms, 94
Bell, Howard H. Hyperplasia of Pineal Body, 553
Bell, W. Blair. Sex Complex (Review), 413
Benham, F. Lucas. Acute Melancholia Treated by Blood Letting, 92
Benon, R. Nervous and Mental Diseases and War, 460
Bergh, A. A. Hijmans van der. Hypernephroma with Hypergenitalism, 84
Bergh, A. A. Hijmans van der, and Hasselt, J. A. van. Case of Pineal Tumour, 82
Berkart, J. B. Pathology and Treatment of so-called Nervous Asthma (Review), 191
Berkeley, W. N. Treatment of Paralysis Agitans with Parathyroid Gland, 402
Bigelow, G. H. Review of 127 Clinical Cases of Ataxic Paraplegia, 384
Binet, A., and Simon, Th. Development of Intelligence of Children (Review), 578; Intelligence of Feeble-Minded (Review), 578
Bing, Robert. Textbook of Nervous Diseases (Review), 281
Biondi, G. Studies on Pineal Gland, 509
Bloch, Leon. Trichinosis: Case with Trichina Larvæ in Spinal Fluid, 86
Bloch, M., and Schulmann, E. Zosteriform Eruptions as Episode in Syphilitic Meningitis, 386
Boez and Duhot. Cerebro-Spinal Meningitis (Mixed Infection by Meningococci and Coli Bacilli), 77
Boidin and Weissenbach. Localised Meningitis of Base. Puriform Aseptic Reaction of Cerebro-Spinal Fluid, Meningococcal Septicæmia. Recovery, 116
Boisseau, J., and Roussy, G. Nervous Symptoms Caused by Bursting of Explosives, 457
Boland, C. Vincent. Case of Influenzal Meningitis, 78
Bolten. Pathogenesis of Certain Forms of Epilepsy, 528
Bonaba, J., and Foresti, C. B. Multiple Visceral Hydatid Cysts (Heart, Brain, Kidneys), 79
Bonard, N. S. New Remedy for Syphilis-Luargol or "102," 394
Bonnel and Joltrain, E. Latent Cerebro-spinal Meningitis, 223
Bolton, Shaw, Bramwell, Byrom, and Robinson, William. Bilateral Lesion of Occipital Lobes, with Retention of Macular as distinct from Panoramic Vision, 251
Bookman, Arthur, and Epstein, Albert A. Metabolism in Myasthenia Gravis, and Administration of Calcium and of Glandular Preparations, 320
Boring, Edwin G. Cutaneous Sensation after Nerve Division, 506
Bosanquet, Wm. Cecil, and Eyre, John W. H. Serums, Vaccines, and Toxins (Review), 415

Bosquet, J., and Sainton, P. Meningococcal Arthritis of Shoulder of Plastic Ankylosing Form, followed by Pulmonary Manifestations and Meningitis. Post-Meningitic Arthritis of Knee. Conjunctivitis and Iridochoroiditis. Complications of Serum Treatment, 225
Boucherot, F. M. A. Mental Diseases in Army in War Time (August 1914—October 1915), 222
Boutet, A., and Rayneau, A. J. Congenital Familial Paramyotonia (Eulenburg's Disease). Transitory Rigidity of Muscles occurring under Influence of Cold and Damp, 238
Boyd, W. Clinical Pathology of Cerebro-Spinal Fluid, 527
Boyd, W. A. Impairment and Loss of Sexual Power in Acromegaly, 119
Bramwell, Byrom, Bolton, Shaw, and Robinson, William. Bilateral Lesion of Occipital Lobes, with Retention of Macular as distinct from Panoramic Vision, 251
Bramwell, Byrom, and Dawson, James W. Spastic Paraplegia of Fifteen Years' Duration, 561
Brandt, H. Case of Relapse of Tetanus, 50
Briggs, L. Vernon. Environmental Origin of Mental Disease in Certain Families, 575
Broadbent, Walter. Treatment of Meningitis, 520
Broadwell, S., Kolmer, J. A., and Matsunami, Toitsu. Effect of Potassium Iodide on Luetin Reaction, 397
Bronner, Augusta F. Research on Proportion of Mental Defectives among Delinquents, 188
Brown, A. C. Pneumococcal Meningitis, with Recovery, following Vaccine Therapy, 385
Bruce, the Late Alexander, and Dawson, J. W. Histology of Disseminated Sclerosis, 285
Bruce, A. Ninian. Case of Disseminated Sclerosis following Exposure, with Long Period of Remission, 1; Treatment of Functional Blindness and Functional Loss of Hearing, 195
Bruce, Sir David. Analysis of Cases of Tetanus treated in Home Military Hospitals from August 1914 to August 1915, 44; from 1st August 1915 to 31st July 1916, 471
Bruce, H. Addington. Sleep and Sleeplessness (Review), 538
Brush, Edward M. Our Work as Psychiatrists and its Opportunities, 408, 531
Bullard, W. N. Mental Disturbances in Feeble-Minded, 92
Burke, G., and Nuzum, J. Differential Diagnosis between Cerebral Hæmorrhage and Softening Due to Thrombosis, 118
Burpitt, H. R. Relative Degrees of Dulness and Backwardness in School Children, and their Causation, 274
Burr, C. B. Art in Insane, 577
Burr, H. Saxton. Regeneration in Brain of Amblystoma.—I. Forebrain, 250
Buscaino, V. M., and Coppola, A. Mental Disturbances in War Time, 221
Butler, Everette E. Organic Depression of Nerve Cell Produced by Prolonged Ether Anæsthesia, 379
Butler, E. Norman. Cerebro-Spinal Meningitis, 37
Butler, Pierce. Stage-Mad Folk in Shakespeare's Day, 531
Buys, L. R. de, and Lanford, J. A. Comparative Study of Luetin and Wassermann Reactions in Infancy and Childhood, 524
Byrnes, C. M. Bilateral and Complete Trigeminal Paralysis without Involvement of other Cranial Nerves, 311

CAJAZEIRA, J. A. Malarial Polyneuritis and Beri-Beri, 89
Camiers, J. des, Nobécourt, and Caussade, L. On Necessity of Continuing Injections of Serum in Prolonged and Relaxing Forms of Meningococcal Meningitis, 42
Campbell, C. Macfie. Nature of Dementia in Dementia Paralytica, 403
Canavan, M. M., and Southard, E. E. Focal Lesions of Cortex of Left Angular Gyrus in two Cases of Late Catatonia, 132
Cannon, W. B., and Cattell, M'Keen. Studies of Conditions of Activity in Endocrine Glands, 376
Canti, R. G. Urea Content of Cerebro-Spinal Fluid, 269
Carati, E. Clinical Studies on Farado-Cutaneous Painful Sensibility, 383
Card, H., and Thom, D. A. Bacteriological Study of Blood of Seventy Epileptics, 529
Carlill, Hildred. Diagnostic Importance of Ankle Jerk, 307; Gluteal Fold in Sciatic Neuritis, 401
Carnot, P. Local and Late Tetanus after Preventive Inoculation. Treatment by Large Doses of Serum. Severe Anaphylaxis. Recovery, 234
Carr, A. M., Johnstone, K. L., and Hassin, K. L. Bullet Lesion of Cauda Equina, 205

Carson, G. R., and Cummins, W. T. A Case of Trichinosis with Embryo in Spinal Fluid, 318
Catola, G. Neuropathology of War: Wounds of Peripheral Nerves, 17
Cattell, M'Keen, and Cannon, W. B. Conditions of Activity in Endocrine Glands, 376
Catton, Joseph H. Studies of Spinal Fluid during Iodide Medication by Mouth, 527
Caulfield, Alfred H., and Hort, Edward C. Epidemic Cerebro-Spinal Fever, 469
Caussade, L., Camiers, J. des, and Nobécourt. Necessity of continuing Injections of Serum in Prolonged and Relaxing Forms of Meningococcal Meningitis, 42
Cecil, R. L. Experimental Non-Hæmolytic Streptococcus Lesions in Vitally Stained Rabbits, 556
Chartier. Treatment of Cerebro-Spinal Meningitis by Dorsal Puncture, 225
Chase, Martin R. Experimental Study of Vagus Nerve, 374
Chatelin, Charles, and Marie, Pierre. Visual Disturbances due to Lesions of Intra-Cerebral Optic Tracts and Cortical Visual Area, 448
Chauffard, Barré, J. A., and Guillain, G. Mid-Plantar Reflex, 305
Chauffard, and Conte, A. le. Multiple Nuclear Paralysis of Diphtheritic Origin, with Meningeal Reaction, 76
Chavigny and Simonin. Hysterical Chorea of Diaphragm, 476
Christie, W. Ledingham. Cranial Tumour, 200
Churchill, F. S., and Austin, R. S. Frequency of Hereditary Syphilis, 523
Ciarla, E. Tabes treated with Intraspinal Subdural Injections of Neosalvarsan. Death, 75
Clark, L. Pierce. Clinical Studies in Epilepsy, 126, 397
Clarke, Frederick B. Study of Anatomical Location and Histopathology of Ninety-Nine Brain Tumours, 485
Clarke, J. Michell. Nervous Affections of the Sixth and Seventh Decades of Life (Bradshaw Lecture), 113; Some Neuroses of War, 456
Claude and Porak. Syndrome of Lesions of Cauda Equina from Gunshot Wounds, 15
Cohen, Eveline, and Forbes, Duncan. Congestion in Treatment of Cerebro-Spinal Meningitis, 226
Coles, Alfred C. Cerebro-Spinal Meningitis: Meningococci found in Peripheral Blood Films, 39
Collet and Petzetakis. Oculo-Cardiac Reflex in Traumatic Lesions of Vagi, 557
Collet, F. J., and Pollosson, P. Continued Partial Epilepsy of Traumatic Origin, 447
Collier, James. Gunshot Wounds and Injuries of the Spinal Cord, 202
Collins, Sir William J. Ethics and Law of Drug and Alcohol Addiction, 127
Colombe, S. Cerebral Rheumatism, 311
Conte, A. le, and Chauffard. Multiple Nuclear Paralysis of Diphtheritic Origin, with Meningeal Reaction, 76
Cooper, A. T., and Snow, C. G. Wassermann Reaction in Relation to Tuberculosis, 396
Cope, V. Zachary. Pituitary Fossa and Surgical Methods of Approach, 314
Copp, Owen. Psychiatric Needs of Large Community, 532
Coppola, A., and Buscaino, V. M. Mental Disturbances in War Time, 221
Coriat, Isador H. Meaning of Dreams (Review), 410; Selective Sensory Regeneration in Ulnar Nerve Lesion, 114; Some New Symptoms in Amaurotic Family Idiocy, 257
Cornell, W. B. Extra-Mural Psychiatry in Baltimore, 92
Corso, G. Reaction of Hermann-Perutz in Syphilitic Affections of Nervous System, 565
Cotten, F., and Gastinel, P. Subacute Typhoid Septicæmia with Meningeal and Pleural Manifestations Simulating Tuberculous Meningitis and Pleurisy, 228
Cotton, Henry A. Treatment of Paresis and Tabes Dorsalis by Salvarsanized Serum, 130
Courtenay, H. D., and McKee, S. H. Syphilis of Eye following Treatment by Salvarsan, 478
Courtois-Suffit, M., and Giroux, R. Abnormal Forms of Tetanus (Review), 484
Craig, C. Burns. Injuries to Peripheral Nerves by Modern Warfare, 453
Crenshaw, Hansell, and Remsen, Charles M. Case of Hemiparesis, Ataxia, and Astereognosis associated with Arachnoidal Œdema, 174
Crozier, W. J. Existence of "Common Chemical Sense" in Vertebrates, 166; Taste of Acids, 375
Cruickshank, J., and Tisdall, C. T. Cholesterol Content of Serum in Mental Diseases, 134
Culbertson, Carey. Menopause and its Vasomotor Disturbances, 570
Cummer, C. L., and Dexter, R. Intraspinal Treatment of Syphilis of Central

Nervous System, according to Method of Swift and Ellis, 120
Cummins, W. T., and Carson, G. R. Trichinosis with Embryo in Spinal Fluid, 318
Cushing, Harvey. Hereditary Anchylosis of Proximal Phalangeal Joints (Symphalangism), 317
Cutler, Elliott C., and Stoddard, James L. Torula Infection in Man (Review), 329

DANA, CHARLES L. Textbook of Nervous Diseases (Review), 282
Dandy, W. E., and Heuer, G. J. Röentgenography in Localisation of Brain Tumour, based on Series of One Hundred Consecutive Cases, 563
Darling, Ira A., and Newcomb, P. B. Correlation of Clinical and Serological Findings in Paresis and Cerebro-Spinal Syphilis, 124
Daumézon, G. Typhoid and Paratyphoid Flora of Cerebro-Spinal Fluid, 43
Davenport, C. B., and Muncey, E. B. Huntingdon's Chorea in Relation to Heredity and Eugenics, 566
Davis, W. Charles. Treatment of Painful Frost-Bite, 33
Dawson, G. de H. Shell Concussion: Treatment by General Anæsthesia, 208
Dawson, James W. The Histology of Disseminated Sclerosis.—I. Introduction, 285; II. Historical, 337; III. Methods, 541.
Dawson, James, and Bramwell, B. Spastic Paraplegia of Fifteen Years' Duration, 561
Dawson, James, Ritchie, J., and Smith, J. Lorrain. Pathology of Trench Frost-Bite, 34
Dearborn, George van Ness. Influence of Joy (Review), 539
Dejerine, J. Radiculitis, 400
Delbanco. Recklinghausen's Disease, 73
Déléphine, S. Prevention of Frost-Bite and Effects of Cold, 29
Denehy, W. J. Epidemic Cerebro-Spinal Meningitis, 466
Deny, G. French Neuropsychopathology during a Year of War (August 1914 to August 1915), 16
Desogus, V. Simulated Skin Disease in Hysterical Patient, 400
Devine, Henry. Biological Significance of Delusions, 133
Dexter, R., and Cummer, C. L. Intraspinal Treatment of Syphilis of Central Nervous System, according to Method of Swift and Ellis, 120
Dixon, W. E., and Halliburton, D. W. Cerebro-Spinal Fluid.—IV. Circulation, 110
Don, Alexander. Tetanus occurring Ten Weeks after Injury, 49
Donaldson, Henry H. Rat (Review), 276; Preliminary Determination of Part Played by Myelin in Reducing Water Content of Mammalian Nervous System (Albino Rat), 373
Donaldson, H. H., Hatai, S., and King, H. D. Post-Natal Growth of Brain, under Several Experimental Conditions: Studies on Albino Rat, 68
Donaldson, R. Etiological Factor in So-Called Cerebro-Spinal Fever, 40
Donkin, Sir Bryan. Occasional Notes on Mental Deficiency Act, 407
Douglas, S. R. Bactericidal Power Acquired by Serum after Salvarsan or Neosalvarsan, 268
Draper, George. Reactions and Results of Treatment in Cerebro-Spinal Syphilis, 120; Abortive and Non-Paralytic Cases of Poliomyelitis, Importance and Recognition, 515
Dufour, H. Acute Relapsing Anterior Poliomyelitis with Rapid Course. Recovery, 475
Duhot and Boez. Cerebro-Spinal Meningitis (Mixed Infection by Meningococci and Coli Bacilli), 77
Dumolard, Rebierre and Quellien. Variations in Tendon Reflexes as Sole Objective Clinical Sign in Severe Asthenic Condition; marked Changes in Cerebro-Spinal Fluid. Rapidly Fatal Termination by Ictus with Meningeal Signs. Probable Syphilitic Origin, 475
Dunn, Williamina Shaw. Pseudologica Phantastica, or Pathological Lying, in Hysteria with Moral Defect, 406
Dunton, W. R., Jr., and Sargent, G. F. Duration of Paresis following Treatment, 572
Dupouy, Roger. "Sign of the Sterno-Mastoid," Symptom of Bulbo-Medullary Irritation, 382
Duprat, P. E. Meningitis from Mumps in Child, 78
Durante, L., and Wilson, L. B. Histologic Changes in First Sympathetic Ganglia in Exophthalmic Goitre, 554

EARLEY, T. B., and Gilpin, S. F. Drainage of Cerebro-Spinal Fluid as Factor in Treatment of Nervous Syphilis, 181
Eastwood, A. Bacteriological Aspects of Meningococcus Carrier Problem, 465
Eder, M. D. Psychopathology of the War Neuroses, 456

Edlavitch, B. M. Intraspinal Injections of Mercurialised Serum in Spastic Paraplegia, 180
Ellis, Arthur W. M. Classification of Meningococci based on Group Agglutination with Monovalent Immune Rabbit Serum, 39
Elsberg, Charles E., and Bailey, Pearce. Laminectomy with Simple Exposure of Spinal Cord: Effects on Reflexes and on Symptoms of Spinal Disease, 307
Embleton, Dennis, and Peters, E. A. Cerebro-Spinal Fever and Sphenoidal Sinus, 38
Emerson, Charles F. Nervous Patient, 89
Emerson, Ernest B. Alcoholism, 267
Emerson, Haven. Importance of Present Epidemic of Poliomyelitis, 516
Emslie, Isabel. War and Psychiatry, 54
Epifanio, G. Prolonged Pharmacological Hypnosis and its Application for Cure of some Psychoses, 95
Epstein, Albert A., and Bookman, Arthur. Metabolism in Myasthenia Gravis, with Administration of Calcium and Glandular Preparations, 320
Esbach, H., and Lacaze, H. Cerebro-Spinal Meningitis Commencing with Mental Disturbance, 77
Escallon, Nobécourt, and Peyre. Cerebro-Spinal Fluid in Cervical Rheumatism with Sciatic Neuralgia, 268
Eschbach, H., and Lacaze, H. Arthritis of Knee with Effusion and Epididymitis in Cerebro-Spinal Meningitis, 38; Cerebro-Spinal Meningitis in Advanced Life, 116
Espenel, A., and Haour, J. Case of Fulminating Death in Course of Latent Abscess of Brain, 449
Etienne G., and Grosjean, A. Staphylococcal Cerebro-Spinal Meningitis and Septicæmia, 386
Evans, Arthur, and Stewart, Purves. Nerve Injuries and their Treatment (Review), 481
Evans, Britton D., and Thorne, F. H. Treatment of Paresis, 270
Evans, J. J., and Assinder, E. W. Pathological Report on Case of Pituitary Infantilism, 522
Eve, Sir Frederick, and Woods, R. S. Experiences in Operative Treatment of Gunshot Injuries of Nerves, 18
Everidge, John. Mental Symptoms in Case of Acute Tetanus during Treatment by Carbolic Injections, 231
Eyre, John W. H., and Bosanquet, Wm. Serums, Vaccines, and Toxins (Review), 415
FALLS, F. H. Proteolytic Ferments of Blood Serum in Tabes Dorsalis and General Paresis, 90
Falta, Wilhelm. Ductless Glandular Diseases (Review), 534
Farani, A. Early Menopause in Virgins, 181
Farrant, Rupert. Causation and Cure of Certain Forms of Lunacy, 323
Farrar, C. B. Factors in Schizophrenic Dementia, 404
Farrell, F. J., and Mecredy, G. G. Acute Tetanus: Recovery, 46
Fearnsides, E. G. Frost-Bite, 28; Pseudo-Hypertrophic Muscular Dystrophy with Amentia, 114; Obesity, Epileptiform Attacks, Recurrent Jaundice in Girl aged 13 Years, 265
Feiling, Anthony. Loss of Personality from "Shell Shock," 20
Feingold, M. Progressive Macular Degeneration in Three Members of Family, 570
Fenestre, and Gerard, P. Absence of Tetanus Toxin in Cerebro-Spinal Fluid of Subjects of Tetanus, 474
Fenger, F. Composition and Physiological Activity of Pineal Gland, 550; Phosphatides in Ductless Glands, 552
Ferrand, J. Aphasia with Left Hemiplegia from Ligature of Right Common Carotid, 449
Fielder, Frank S. Paralysis during Pasteur Antirabic Treatment, with Reports of Seven Personal Cases, One Terminating Fatally, 309
Fildes, P., and M'Intosh, James. Method of Applying Wassermann Reaction in Large Numbers, 478
Finch, G. Optic Neuritis following on "Gassing," 54
Findlay, Leonard, and Paton, D. Noel. Observations on Nerve Endings, Receptive Substance, and Contractile Substance of Muscle, 111
Fischer, W., and Leschcziner, H. Traumatic Addison's Disease: Diffuse Pigmentation of Skin after Bullet Wound in Suprarenal Region, 53
Fisher, Homer G., and Muller, Henry R. Unilateral Destruction of Semicircular Canals in Cats, 375
Flack, Martin, and Gordon, M. H. Investigation concerning Disinfection of Meningococcus Carriers, 468
Fleming, R. A., and Gibson, H. J. C. Three Cases of Beri-Beri, 317
Fleming, S., Lundie, Alex., and Thomas, D. J. Pleomorphism of Meningococcus, 41
Fletcher, William. Luetin Reaction in Syphilis, 523

Flexner, Simon. Microbic Cause and Manner of Infection of Poliomyelitis, 69, 513; Serum Treatment of Poliomyelitis, 516
Flexner, Simon, and Amoss, Harold L. Chemical *versus* Serum Treatment of Epidemic Meningitis, 230
Flournoy, Th. Modern Mystic, 69
Floyd, C., and Morse, J. L. Etiology of Chorea, 399
Foix, Ch., and Marie, Pierre. Syncinesias of Hemiplegics, 388
Forbes, Duncan, and Cohen, Eveline. Congestion in Treatment of Cases of Cerebro-Spinal Meningitis, 226
Foresti, C. B., and Bonaba, J. Multiple Visceral Hydatid Cysts (Heart, Brain, Kidneys), 79
Forsyth, David. Functional Nerve Disease and Shock of Battle, 21
Fort, R. le. Pseudo-Tetanic Symptoms in Wounded, with Nerve Lesions Complicated by Presence of Foreign Bodies, 45
Foster, Kennedy. Stock-Brainedness, Causative Factor in So-Called "Crossed Aphasias," 562
Foster, Michael, and Gaskell, J. F. Cerebro-Spinal Fever (Review), 482
Fowler, J. S. Case of So-Called "Tetanism," 128
Fox, R. Fortescue. Model Hydrotherapeutic Installation for Soldiers, with Ground Plan, 479
Franz, Shepherd Ivory. Functions of Psychologist in Hospital for Insane, 138
Fraser, J. S. Neuritis of Cochlear Division of Eighth Nerve following Exposure to Cold, 129
Froment, J., and Babinski, J. Nervous Disturbances of Reflex Origin, 557
Fulk, M. E., and Macleod, J. J. R. Active Principle of Retro-Peritoneal Chromaphil Tissue has same Action as that of Suprarenal Glands, 111
Fullerton, Andrew. Use of Sleeve of Vein in Nerve Suture, 20
Fursac, J. Rogues de, and Rosanoff, A. J. Manual of Psychiatry (Review), 536

GAINES, L. M. Epidemic Cerebro-Spinal Meningitis Developing Twenty-two Hours after Abdominal Operation, 117
Galliard, L. Hysterical Tachypnœa in Soldier, 239
Gamble, M. F. H. Etiology of Epidemic Cerebro-Spinal Meningitis, 466
Garrison, P. E., Siler, J. F., and MacNeal, W. J. Subsequent History of Pellagrins in Spartanburg County, S.C., who Survived Initial Attack, 392
Garton, Wilfrid. Shell Shock and Treatment by Cerebro-Spinal Galvanism, 455
Gaskell, J. F., and Foster, Michael. Cerebro-Spinal Fever (Review), 482
Gaskell, W. H. Involuntary Nervous System (Review), 325
Gastinel, P., and Cotten, F. Subacute Typhoid Septicæmia with Meningeal and Pleural Manifestations Simulating Tuberculous Meningitis and Pleurisy, 228
Gaucher. On the Early Onset of Severe Nervous Symptoms in Syphilis after Treatment by "606," 392; Necessity of very Prolonged Mercurial Treatment in General Paralysis, 403; Venereal Diseases during War, 478
Gauss, Harry. Cerebral Fat Embolism with Reference to Pathology of Delirium and Coma, 388
Gerard, P., and Fenestre. Absence of Tetanus Toxin in Cerebro-Spinal Fluid of Subjects of Tetanus, 474
Giannuli, F. Tumours of Temporal Lobe, 80; Tumours of Centrum Ovale of Right Prefrontal Lobe, 259
Gibson, Gordon. Relationship between Pelvic Disease and Manic-Depressive Insanity, 532
Gibson, H. J. C., and Fleming, R. A. Three Cases of Beri-Beri, 317
Gilpin, S. F., and Earley, T. B. Drainage of Cerebro-Spinal Fluid as Factor in Treatment of Nervous Syphilis, 181
Girod, F. Partial Tetanus of Limbs with Early Onset, 472
Giroux, R., and Courtois-Suffit, M. Abnormal Forms of Tetanus (Review), 484
Glogau, Otto, and Scripture, May K. Speech Conflict—Natural Consequence in Cosmopolitan Cities—as Etiological Factor in Stuttering. Preliminary Report based on 200 Cases, 172
Goddard, Henry Herbert. Criminal Imbecile (Review), 140
Goldberger, Joseph. Pellagra: Causation and Method of Prevention, 179
Good, James Percy. Causation of Spina Bifida, 253
Goodwin, T. H. Field Service Notes for R.A.M.C. (Review), 241
Gordon, Alfred. Overactivity as Potent Factor in Etiology of some Nervous Diseases, 112; Ventricular Hæmorrhage, Symptom Group, 175; Aphasia, apropos of Case of Verbal Amnesia and Alexia, 261; Hydromyelia and Hydroencephalia, 308
Gordon, M. H., and Flack, Martin. Disinfection of Meningococcus Carriers, 468

Gordon, M. H., and Hine, T. G. M. Cultural Requirements of Meningococcus, 468

Got. Otogenic Cerebral Abscesses, 449

Grabfield, G. Variations in Sensory Threshold for Faradic Stimulation in Psychopathic Subjects, 188

Gray, Norman. Pregnancy Complicated by Increased Cerebro-Spinal Pressure, 527

Greig, Donald. Somatic Characteristics of General Paretics, 90

Grey, Ernest G. Localisation of Function in Canine Cerebellum, 164

Griffith, A. Hume. After-Care Report of Epileptics following Colony Treatment, 126

Griffith, Fred. Identification of Meningococcus in Naso-Pharynx with Reference to Serological Reactions, 465

Grosjean, A., and Etienne, G. Staphylococcal Cerebro-Spinal Meningitis and Septicæmia, 386

Grossman, Jacob. Spastic Paralysis in Children, 174

Grove, L. W. Treatment of Cerebro-Spinal Syphilis, 573

Guillain, G., and Barré, J. A. Paralysis of the Oculo-Motor Nerve at the Onset of Paratyphoid A, 235; Ankle Clonus, Pyramidal Clonus and Non-Pyramidal Clonus, 306; Different Behaviour of Cutaneous Plantar Reflex in Dorsal and Ventral Position in Pyramidal Lesions, 307; Organic Pyramidal Lesions following Explosion of Projectile without External Wound, 458; Plantar Reflex in Acute Ataxia and Position of Patient, 474

Guillain, G., Barré, J. A., and Chauffard. Mid-Plantar Reflex, 305

Guillain, G., Barré, J. A., and Strohl, A. Clinical Dissociation of Tendo-Achilles Reflex and Mid-Plantar Reflex, 306

Guinon and Halbron. Meningeal Syndrome in Child during Attack of Varicella. Normal Cerebro-Spinal Fluid. Hemiparesis of Palate, &c., 173

Gunson, E. B. Crossed Hip Reflex in Enteric Fever, 382

Guthrie, Douglas. Hexamine in Aural Suppuration and Meningitis, 387

Guttman, John, and Neuhof, Selian. Radial Pulse Difference and Left Recurrent Nerve Paralysis due to Mitral Stenosis, 185

Guy-Laroche and Le Pape. Purpura Fulminans. Hyperacute Meningococcal Septicæmia, 463

HALBRON and Guinon. Meningeal Syndrome in Child during Attack of Varicella. Normal Cerebro-Spinal Fluid. Hemiparesis of Palate, &c., 173

Hall, Arthur. Two Cases of Plumbism from Unusual Sources, 119

Hall, Walter, and Peters, B. A. I. Changes in Agglutinability, Fermentation Reactions, and Absorptive Capacities of Meningococcus during Acute Attack, 467

Haller, D. A., and Walker, I. C. Treatment of Syphilis of Central Nervous System, with Intravenous Salvarsan Alone, with Intravenous Salvarsan and Intraspinal Salvarsanized Serum Together, and with Intraspinal Salvarsanized Serum Alone, 393

Halliburton, W. D. Possible Functions of Cerebro-Spinal Fluid, 525

Halliburton, W. D., and Dixon, W. E. Cerebro-Spinal Fluid. — IV. Circulation, 110

Hanes, Fred. M. Spinal Fluid Syndromes of Nonne and Froin, and their Diagnostic Significance, 396

anes, Fred. M., and Willis, A. M. Circumscribed Cysts of Leptomeninges, with Successful Operative Case, 558

Haour, J., and Espenel, A. Fulminating Death in Course of Latent Abscess of Brain, 449

Hardwick, Rose S. Programme for Mental Examination of Asocial, Psychopathic, and Doubtful Subjects, 187

Harris, Wilfred. Nerve Injuries and Shock (Review), 56; Gunshot Injuries of Peripheral Nerves, 19

Harrison, L. W., and Mills, C. H. Ferrivine and Intramine in Syphilis, 319

Hart, Bernard. Psychology of Rumour, 302

Harwood, T. E. Nature and Treatment of Concussion, 209

Hasselt, J. A. van, and Bergh, A. A. Hijmans van der. Case of Pineal Tumour, 82

Hassin, G. B. Dementia and Multiple Brain Abscesses, 135

Hassin, G. B., Johnstone, K. L., and Carr, A. M. Bullet Lesion of Cauda Equina, 205

Hatai, S., Donaldson, H. H., and King, H. D. Post-Natal Growth of Brain under Experimental Conditions: Studies on the Albino Rat, 68

Hayward, John D. Traumatic Tetanus: Curious Factor Complicating Early Diagnosis, 48

Head, Henry. Hughlings Jackson on Aphasia and Kindred Affections of

Speech, 261; Reprint of Hughlings Jackson's Papers on Speech, 261; Chronological List of Hughlings Jackson's Papers Bearing on Speech, 261
Healy, William, and Healy, Mary Lenney. Pathological Lying, Accusation, and Swindling (Review), 189
Heiman, Henry. Subcutaneous Injections of Magnesium Sulphate in Chorea, 400
Henderson, D. K. Treatment of Drug Addiction, 267; Catatonia as Type of Mental Reaction, 322
Hernaman-Johnson. Necessity for Prolonged Treatment in Infantile Paralysis, 517
Herrman, Charles. Progressive Lipodystrophy, 258
Hertz, Arthur. Paresis and Involuntary Movements following Concussion Caused by High Explosive Shell, 26
Hertz, Arthur, and Ormond, Arthur W. Treatment of Concussion Blindness, 25
Herzog, M., and Nuzum, J. W. Etiology of Acute Epidemic Poliomyelitis, 519
Heuer, G. J., and Dandy, W. E. Röentgenography in Localisation of Brain Tumour based on One Hundred Consecutive Cases, 563
Hine, T. G. M., and Gordon, M. H. Cultural Requirements of Meningococcus, 468
Hird, R. Beatson. Sarcoma of Frontal Lobe giving rise to Ocular Signs only, 314
Hirsch, Edwin F. Gastric Mucosa in Delirium Tremens, 177
Hirschfelder, A. D. Brain Lipoid as Hæmostatic, 96
Hoch, August. Study of Benign Psychoses, 91; Dementia of Cerebral Arteriosclerosis, 405
Hoffman, W. O., and Schwartz, A. B. Permanganate Reduction Index of Cerebro-Spinal Fluid, 124
Holbrook, C. S. Syphilis in East Louisiana Hospital for Insane, 573
Holmes, Bayard. Dementia Præcox Studies, 573, 574
Holmes, Gordon. Spinal Injuries of Warfare, 13
Holmes, Gordon, and Sargent, Percy. Injuries of Superior Longitudinal Sinus, 5; Treatment of Cranial Injuries of Warfare, 8; Later Results of Gunshot Wounds of Head, 447
Holmes, Gordon, and Smith, S. Bilateral Motor Apraxia with Disturbance of Visual Orientation, 201
Holmes, William H. *B. Welchii* in Stools of Pellagrins, 178
Hopkins, J. G., and Zinsser, Hans. Studies on *Treponema pallidum* and Syphilis.—II. Spirochæticidal Antibodies against *Treponema pallidum*, 122
Hopkins, J. G., Zinsser, Hans, and M'Burney, Malcolm. Studies on *Treponema pallidum* and Syphilis.—III. Individual Fluctuations in Virulence and Comparative Virulence of *Treponema pallidum* Strains passed through Rabbits, 123. IV. Difference in Behaviour in Immune Serum between Cultivated Non-Virulent *Treponema pallidum* and Virulent Treponemata from Lesions, 123
Hopkins, J. G., Zinsser, Hans, and Ottenberg, Reuben. Laboratory Course in Serum Study (Review), 284
Horder, Thomas J. Cerebro-Spinal Fever (Review), 55
Horrax, Gilbert. Studies on Pineal Gland.—I. Experimental Observations. II. Clinical Observations, 315
Horsley, Sir Victor. Gunshot Wounds of the Head, 7; Obituary, 583
Hort, Edward C. Epidemic Cerebro-Spinal Fever, 230
Hort, Edward C., and Caulfield, A. H. Epidemic Cerebro-Spinal Fever, 469
Hossack, James. Diffuse Traumatic Aneurysm of Femoral Artery with Cerebral Complications, 236
Hoskins, E. R. Growth of Body and Organs of the Albino Rat as Affected by Feeding Various Ductless Glands (Thyroid, Thymus, Hypophysis, and Pineal), 378
Howitt, H. O., and Jones, D. H. Injection of Oxygen as Treatment for Tetanus, 50
Hunt, E. L. Intraspinal Mercurialised Serum in Treatment of Syphilis of Nervous System, 121; Unilateral Hydrocephalus, 257
Hunt, J. Ramsay. Late Paralysis of Ulnar Nerve: Form of Chronic Progressive Neuritis Developing many years after Fracture of Elbow Joint, 71; Sensory Field of Facial Nerve and Symptomatology of Geniculate Ganglion, 298
Hurd, Henry. Institutional Care of Insane in United States and Canada (Review), 409
Huriez, C., and Sainton, P. Bilateral Paralysis of Brachial Plexus of Upper Root Type in Mumps, 52
Hurry, J. B. Vicious Circles in Sociology and their Treatment (Review), 101
Hutchison, R. Fainting Attacks in Children, 319
Hutinel, J., Baur, J., and Sevestre, J. Mild Meningococcal Septicæmia of Intermittent Fever Type following Cerebro-Spinal Meningitis. Recovery, 223

INGEBRIGTSEN, RAGNVALD. II. Life of Peripheral Nerves of Mammals in Plasma, 109

JACKSON, HARRY. Craniopharyngeal Duct Tumours, 175; Perithelioma of Hypophysis, 554
Jacob, F. M. Glioma of Cerebellum with Metastases, 304
Jarkowski, J. Remarks on Defence Reflexes called "Medullary Automatism," 380
Jeanselme, E. Anomalies of Visual Apparatus, Intelligence and Skeleton with General Neurofibromatosis, 53
Jenson, E. T. Fear and Disease, 88
Job, E., and Ballet, B. Nervous Complications of Typhus Fever, 173
Johnston, M. R. Normal and Pathologic Cerebro-Spinal Fluid in Children, 395
Johnstone, K. L., Hassin, G. B., and Carr, A. M. Bullet Lesion of Cauda Equina, 205
Joltrain, E., and Bonnel. Latent Cerebro-Spinal Meningitis, 223
Jones, A. Bassett, and Llewellyn, L. L. Jones. Fibrositis (Review), 192
Jones, D. H., and Howitt, H. O. Injection of Oxygen as Treatment for Tetanus, 50
Jones, H. Lewis. Electric Methods and Radiography in Diagnosis and Treatment of Neurological Conditions, 96
Jones, W. A. Myasthenia Gravis, with Thymoma, 522
Josefson, Arnold. Distortions of Visual Fields in Pituitary Tumour, 81
Jung, C. G. Theory of Psychoanalysis (Review), 98; Collected Papers on Analytical Psychology (Review), 412

KEEGAN, J. J. Study of Plains Indian Brain, 372
Kelynack, T. N. Drink Problem of To-day (Review), 581
Kennedy, Foster. Diagnostic Value of Retrobulbar Neuritis in Expanding Lesions of Frontal Lobes, 521
Kilgore, A. R. Peripheral Neuritis following Emetin Treatment of Amœbic Dysentery, 568
Kilner, T. P. Severe Tetanus Successfully Treated by Antitoxin, 232
King, H. D., Donaldson, H. H., and Hatai, S. Post-Natal Growth of Brain, under Experimental Conditions; Studies on Albino Rat, 68
Kirby, George H. Alcoholic Hallucinosis, with Reference to Prognosis and other Psychoses, 404
Knapp, P. C. Criminal Responsibility, 136
Koch, Sumner L. Structure of Third, Fourth, Fifth, Sixth, Ninth, Eleventh, and Twelfth Cranial Nerves, 506
Kocher, R. A. Effect of Activity on Histological Structure of Nerve Cells, 505
Kolmer, J. A., Matsunami, Toitsu, and Broadwell, S. Effect of Potassium Iodide on Luetin Reaction, 397
Koplik, Henry. Acute Poliomyelitis, 514
Krabbe, Knud. New Familial Infantile Form of Diffuse Brain Sclerosis, 390
Krehl, Ludolph. The Basis of Symptoms (Review), 331
Krolunitzky, G., and Ravaut, P. Mumps and Parameningococcus Meningitis. Cure by Intraspinal Lumbar and Cervical Injections of Dopter's Antipara-Meningococcus Serum, 43
Krolunitsky, G., and Ravaut, P. Generalised Diphtheritic Paralysis, with Meningeal Reaction, 475
Kruif, P. H. de, and Wile, Udo J. Cultural Experiments, with *Spirochæta pallida* derived from Paretic Brain, 130
Krumholz, Sigmund. Atypical Sclerosis, with Bulbar Paralysis, 312

LACAZE, H., and Eschbach, H. Arthritis of Knee, with Effusion and Epididymitis in Cerebro-Spinal Meningitis, 38; Cerebro-Spinal Meningitis Commencing with Mental Disturbance, 77; Cerebro-Spinal Meningitis in Advanced Life, 116
Lam, P. W., and Law, E. Intracranial Hæmorrhage without Symptoms of Compression, 259
Landau. Superior Radio-pronator Reflex, 556
Lanford, J. A., and Buys, L. R. de. Comparative Study of Luetin and Wassermann Reactions in Infancy and Childhood, 524
Langelaan, J. H. Muscle Tonus, 165
Langley, J. N. Cause and Nature of Changes in Muscle after Nerve Section, 300
Lantuéjoul, Baudouin, and Souques. Two Cases of Aran-Duchenne Amyotrophy of Syphilitic Origin, 513
Larkin, John H., and Levy, I. J. Pathological Study of Syphilitic Aortitis and its Serology, 87
Laroche, G., and Lecaplain. Small Epidemic of Meningeal Form of Paratyphoid B, 228

Lautier, J. M. H. A. Mental Disease in Army. Can Imbeciles be Made Use of? 479
Law, E., and Lam, P. W. Intracranial Hæmorrhage without Symptoms of Compression, 259
Lecaplain and Laroche, G. Small Epidemic of Meningeal Form of Paratyphoid B, 228
Lafora, G. R. Nervous Affections following Malaria, 254
Lee, John R. Removal of Intracranial Foreign Body under X-Rays, 199
Leclere, Albert. Psychology of Graphites, 168
Leschcziner, H., and Fischer, W. Traumatic Addison's Disease: Diffuse Pigmentation of Skin after Bullet Wound in Suprarenal Region, 53
Lesure and Milian, G. Curative Action of Anti-Tetanic Serum, 49
Levinson, A., and Abt, I. A. Study of Two Hundred and Twenty-six Cases of Chorea, 529
Levy, I. J., and Larkin, John H. Pathological Study of Syphilitic Aortitis and its Serology, 87
Levy-Valensi, S., and Sicard, J. A. Latent Syphilis in Arabs. Reactions in Blood and Cerebro-Spinal Fluid, 394
Lewis, Dean. Pressor Substance in Fœtal Hypophysis, 250
Lewis, R. W., and Pappenheimer, A. M. Involutional Changes in Adrenal Cortex during Infancy, 300
Lind, John E. Statistical Study of Hallucinations in Manic-Depressive Psychoses, 91
Lintz, William. Trichinosis and Cerebro-Spinal Fluid, 318
Lisi, L. de. Influence of Coffee and Veronal Intoxication on Spermatogenetic Function of Normal Animals, and Animals Subjected to Cerebral Commotion, 476
Lhermitte, J. Cerebral Lesions in Avitaminic Polyneuritis, 567
Llewellyn, Ll. Jones, and Jones, A. Bassett. Fibrositis (Review), 192
Loffler, W. Alcoholic Polyneuritis with Unilateral Diaphragmatic and Laryngeal Paralysis, 89
Longin, L. A. So-called Frost Bite of Feet, 26
Loughnane, F. M'G. Note on Frost-Bite, 32
Low, J. Serous Typhoid Meningitis, 227
Lowrey, L. G. Wassermann Test in Practical Psychiatry, 273
Lucherini, Tommaso. Traumatic Lesion of Right Frontal Lobe, 13
Luciani, Luigi. Human Physiology (Review), 277
Lucke, Baldwin. Tabes Dorsalis: Pathological and Clinical Study of 250 Cases, 309
Lugaro, E. Emperor's Madness or National Aberration, 4
Lugaro, E., and Tanzi, E. Text-Book of Mental Diseases (Review), 96
Lumière, Auguste. Presence of Tetanus Bacillus on Surface of Projectiles Enclosed within Cicatrised Wounds, 473
Lumsden, Thomas. Psychology of Malingering and Functional Neuroses in Peace and War, 454
Lundie, Alex., Thomas, D. J., and Fleming, S. Pleomorphism of Meningococcus, 41

MacAdam, Wm. Thrombosis of Cerebral Arteries in Paratyphoid B, 235, 477
McBurney, M., Zinsser, Hans, and Hopkins, J. G. *Treponema pallidum* and Syphilis. III. Fluctuations in Virulence of *Treponema pallidum* Strains passed through Rabbits, 123; IV. Difference between Cultivated Non-Virulent *Treponema pallidum* and Virulent *Treponemata* from Lesions, 123
M'Carty, F. B. Neuritis in Pregnancy, 266
M'Clure, J. C. Neurasthenia Gastrica, 128
MacConkey, A. T. Prophylaxis of Tetanus, 45
MacConkey, A. T., and Zilva, S. S. Iodine in Tetanus, 235
M'Crudden, R. H., and Sargent, C. S. Hypoglycæmia and Progressive Muscular Dystrophy, 257
M'Curdy, John T. Clinical Study of Epileptic Deterioration, 398
M'Donagh, J. E. R. Links in Chain of Research on Syphilis (Oxidation and Reduction) (Review), 334
Macdonald, N., and Phillips, S. Syphilitic Nephritis Treated by Salvarsan, 87
M'Dougall, Wm. Introduction to Social Psychology (Review), 141
M'Dowall, Colin. Nucleinate of Soda in Acute Mental Disorders, 274
M'Intosh, James, and Fildes, Paul. Method of Applying Wassermann Reaction in Large Numbers, 478
M'Iver, J., and Price, G. E. Drug Addiction, 183
M'Kee, S. H., and Courtenay, H. D. Syphilis of Eye following Salvarsan, 478
M'Kendrick, A. Back Injuries and their Significance (Review), 193

Mackenzie, H. Exophthalmic Goitre, 530
Mackinnon, R. Post-mortem Findings in Exophthalmos due to Graves' Disease, 402
Macleod, J. J. R., and Fulk, M. E. Active Principle of Retro-Peritoneal Chromaphil Tissue has same Action as that of Suprarenal Glands, 111
MacNamara, N. C. Instinct and Intelligence (Review), 101
MacNeal, W. J., Garrison, P. E., and Siler, J. F. History of Pellagrins in Spartanburg County, S.C., who Survived Initial Attack, 392
MacNeal, W. J., and Smith, J. W. Comparative Study of Different Methods of Wassermann Test, 565
Macredy, G. G., and Farrell, F. J. Acute Tetanus: Recovery, 46
Maeder, A. E. Dream Problem (Review), 411
Maille, J., and Sainton, P. Meningococcal and Pneumococcal Meningitis with Chronic Otorrhœa, 116; Meningococcal Meningitis and Tuberculosis, 224
Maixandeau, V. Cardio-Vascular and Mental Complications in Cerebro-Spinal Meningitis of Adult, 461
Makins, Sir G. H. Cerebral Embolism from Gunshot Injury to Carotid Arteries, 449
Mann, Frank C. Ductless Glands and Hibernation, 377
Marie, P. L. Late Localised Tetanus of Abdomino-Thoracic Type, 473
Marie, Pierre, and Athanassio-Benisty, Mme. Clinical Individuality of Peripheral Nerves, 451
Marie, Pierre, and Chatelin, C. Visual Disturbances due to Lesions of Intracerebral Optic Tracts and Cortical Visual Area, 448
Marie, Pierre, and Foix, Ch. Syncinesias of Hemiplegics, 388
Marinesco, G. Anæsthesia, or Anæsthesia with Local Hyperthermia, in Tabetic Arthropathy, 511
Marinesco, G., and Radovici, A. Cortical Centre for Winking, 512
Marshall, J. A. Salivary Factor, Dental Caries and Immunity in Dementia Præcox and Epilepsy, 127
Marsary, E. de, and Lockmann. Statistics of 243 Soldiers Suffering from Mumps. Frequency of Orchitis and Meningeal Reactions, 471
Matsunami, Toitsu, Kolmer, J. A., and Broadwell, S. Potassium Iodide on Luetin Reaction, 397
Matta, A. A. da. Optic Neuritis in Meningitis Caused by Pernicious Malarial Fever, 115; Intermittent Hiccough and Plantar Hyperæsthesia (Larval Malaria), 254
Mayo-Robson, A. W. Frost-Bite, 33
Meade, H., and Stoney, J. A. Nerve Suture for Bullet Wounds, 17
Meige, Henry. Tremors following Explosions, 459; Attitudes in Wounded Neurotics, 461
Meltzer, S. J. Magnesium Sulphate in Tetanus, Apparatus for Pharyngeal Insufflation, 51
Mendes, R. T. Exaggeration of Reflexes in Polyneuritis, 254
Mercier, Charles A. Causation — with Chapter on Belief, 274; Diet in Causation of Mental Disease, 322
Merklen, P. Psychical Complications of Paratyphoid, 477
Metivier, V. M. Broncho-Pneumonia with Hemiplegia, 79
Meyer, Adolph. Scope of Psychopathology, 408
Michael, J. C. Tabetic Ocular Crisis, 560
Milian, G., and Lesure. Curative Action of Anti-Tetanic Serum, 49
Miller, Charles. Observations on 376 Cases of Frost-Bite, 31
Milligan, E. Cerebro-Spinal Fever, 36
Mills, C. H., and Harrison, L. W. Ferrivine and Intramine in Syphilis, 319
Mills, Charles K. Nursing and Care of Nervous and Insane (Review), 100
Milner, C. E. H. Traumatic Double Hemianopsia, with Partial Recovery, 11; Acute Septic Meningitis due to *B. coli* following Skull Wound, 12; Function of Medullary Nerve Sheath, 301
Mingazzini, G. Clinical and Pathological Contribution to Study of Pontine Tumours, 313
Mitchell, Weir, M.D., LL.D., F.R.S., 1829-1914. Memorial Addresses and Resolutions (Review), 416
Molnar, M. E. New Method in Religious Psychology, 169
Momose, Goro. Inosital of Brain and its Preparation, 250
Mondolfo, E. Prophylaxis of Diphtheritic Paralysis, 253
Moody, D. W. Keiller. Diagnosis of So-Called Primary Tuberculous Meningitis, 78
Moorhead, T. Gillman. Meningitis Serosa, 117
Moreira, J., and Vianna, U. Causes of General Paralysis in Rio de Janeiro, 571
Morgenstern, H. Exanthem and Relapse in Epidemic Cerebro-Spinal Meningitis, 77

Morse, J. L., and Floyd, C. Etiology of Chorea, 399
Morse, Sterne. Dry Permanent Standards in Wassermann Reaction, 125
Morsier, Valerie de. What becomes of Children who pass out of Special Classes? 168
Morton, E. R. Essentials of Medical Electricity (Review), 415
Mott, Fred. W. Effects of High Explosives upon Central Nervous System, 216
Mott, F. W., and Others. Discussion on Shell Shock without Visible Signs of Injury, 213
Motzfeldt, K. Hypophysis and Diuresis —I. Diabetes Insipidus and Hypophysis; II. Action of Pituitary Extracts on Diuresis, &c., 119
Mouat, Thomas B. General Tetanus following Local Tetanic Spasms of Injured Limb, 233
Mouchet, Albert. Chronic Recurrent Tetanus, 233
Moyle, H. H. Odour of Paint as Cause of Plumbism, 317
Muller, H. R., and Weed, Lewis H. Falling Reflex of Cats, 374
Muller, H. R., and Fisher, Homer G. Unilateral Destruction of Semicircular Canals in Cats, 375
Muncey, E. B., and Davenport, C. B. Huntingdon's Chorea in Relation to Heredity and Eugenics, 566
Murphy, J. Tetanus, with Recovery, 48
Mussen, Aubrey. Finer Histological Changes in Traumatic Degenerations of Spinal Cord, following Bullet Wounds of Cord Substance, or Shock to Vertebral Column, 417
Myers, J. A., and Rasmussen, A. T. Absence of Chromatolytic Change in Central Nervous System of Woodchuck during Hibernation, 372
Myerson, A. Meaning of Adductor Responses of Leg, 170; Pathological Findings in Sympathetic System in Psychoses, 273

NAKANO, H. Value of Diagnostic Methods for Cerebro-Spinal Fluid, 526
Neal, J. B. Laboratory Aids in Diagnosis of Poliomyelitis, 518
Neisser, A. When should Cerebro-Spinal Fluid be Examined in Syphilis? 85
Nelson, Burt E. Chemical Studies on Central Nervous System, 404
Nesbitt, Charles T. Sanitation and Control of Pellagra, 120
Netter, A. Serum Disease after Injection of Human Serum into Spinal Canal, 75; Anti-Meningococcal Serum in Present Epidemic of Cerebro-Spinal Meningitis, 255; Cure of Suppurative Meningococcal Iridochoroiditis by Injection of Anti-Meningococcal Serum into Vitreous, 256
Neuhof, Selian, and Guttman, John. Radial Pulse Difference and Left Recurrent Nerve Paralysis due to Mitral Stenosis, 185
Newbolt, G. P. Tetanus: Recovery, 47
Newcomb, P. B., and Darling, Ira A. Correlation of Clinical and Serological Findings in Paresis and Cerebro-Spinal Syphilis, 124
Nicholson, M. A. Effect of Typhoid Inoculation on Endemic Goitre at Lawrence Military Asylum, Sanawar, Punjab, 533
Nobécourt, P. Syndrome of Cervical Rheumatism with Sciatic Neuralgia. Meningeal Reaction. Diagnosis from Cerebro-Spinal Meningitis, 229
Nobécourt, P., Camiers, J. des, and Caussade, L. Necessity of continuing Injections of Serum in Prolonged Forms of Meningococcal Meningitis, 42
Nobécourt, P., Escallon, and Peyre. Cerebro-Spinal Fluid in Syndrome of Cervical Rheumatism, with Sciatic Neuralgia, 268
Nobécourt, P., and Peyre, F. Leucocyte Count in Cerebro-Spinal Fluid in Syndrome of Cervical Rheumatism, with Sciatic Neuralgia, 396; Meningococcal Cerebro-Spinal Meningitis. Severe Form with Prolonged Course, &c., 462
Noel, H. L. C., and Anderson, H. M. Shrapnel Injury to Right Parietal Cortex, 12
Norman, Hubert J. Cerebral Associations of Raynaud's Disease, 569
Nuthall, A. W. Gunshot Wound of Superior Longitudinal Sinus, 200
Nuzam, Frank, and Bassoe, Peter. Central Peripheral Neurofibromatosis, 73
Nuzum, John W. Needless Surgical Operations from Failure to Recognise Tabes, 114
Nuzum, J., and Burke, G. Differential Diagnosis between Cerebral Hæmorrhage and Softening due to Thrombosis, 118
Nuzum, J. W., and Herzog, M. Experimental Studies in Etiology of Acute Epidemic Poliomyelitis, 519

OBREGIA, Urechia, and Popea. Hypophyseal Dystrophy, 521
Oliver, W. W., and Wherry, Wm. B. Blood Cultures in Epilepsy, 528

O'Malley, J. F. Functional Aphonia, 26; Warfare Neuroses of Throat and Ear, 207
Ormond, A. W., and Hertz, A. F. Treatment of Concussion Blindness, 25
Orton, Samuel T. General Paresis from Histological Standpoint, 531
Ottenberg, Reuben, Zinsser, Hans, and Hopkins, J. G. Laboratory Course in Serum Study (Review), 284

PAGE, C. MAX. Frost-Bite in Present War, 30
Pal, S. B. Sarcoma of Dura Mater, 260
Pansky, A. Bullet Wound of Left Posterior Central Convolution, 13
Pape, Le, and Guy-Laroche. Purpura Fulminans Hyperacute Meningococcal Septicæmia, 463
Pappenheimer, A. M., and Lewis, R. W. Involutional Changes in Adrenal Cortex during Infancy, 300
Pardi, Ugo. Histological Modifications which Pituitary Extract Induces in Thyroid, 302.
Parker, Beryl. Psychograph of Rossolimo, 577
Parsons, J. Herbert. Psychology of Traumatic Amblyopia following Explosion of Shells, 23
Pastine, C. Commotion of Nerve Centres by Violent Explosion Close at Hand. Influence of Physical Pain on Psychical State, 458
Paton, D. Noël, and Findlay, L. Observations on Nerve Endings, Receptive Substance, and Contractile Substance of Muscle, 111
Patrick, G. T. W. Psychology of Relaxation (Review), 580
Paulian, D.-Em. Facial Phenomenon and Contralateral Facial Sign, 556; Cerebellar Hemiplegia, 562
Peachell, G. E. "Status Epilepticus" and Death due to Cerebral Cysts of *Cysticercus cellulosæ*, 237
Pemberton, Hugh S. Psychology of Traumatic Amblyopia following Explosion of Shells, 24
Penhallow, D. Pearce. Tetanus occurring Two Months after Wound, 234
Péraire, M. Recovery from Severe Late Tetanus, 48
Perkins, Anne E. Relation of Pelvic Diseases to Mental Disorders, 135
Perrin, H. Fulminating Form of Autogenic Meningitis, 43
Peters, B. A. I., and Hall, W. Changes in Agglutinability, Fermentation Reactions, and Absorptive Capacities of Meningococcus during Acute Attack, 467
Peters, E. A., and Embleton, D. Cerebro-Spinal Fever and Sphenoidal Sinus, 38
Petty, O. H. Infantile Paralysis Treated with Immune Serum, 559
Petzetakis and Collet. Oculo-cardiac Reflex in Traumatic Lesions of Vagi, 557
Peyre, E., and Nobécourt, P. Leucocyte Count in Cerebro-Spinal Fluid in Syndrome of Cervical Rheumatism with Sciatic Neuralgia, 396; Meningococcal Cerebro-Spinal Meningitis. Severe Form with Prolonged Course, &c., 462
Peyre, Nobécourt, P., and Escallon. Cerebro-Spinal Fluid in Syndrome of Cervical Rheumatism with Sciatic Neuralgia, 268
Phillips, S., and Macdonald, N. Syphilitic Nephritis Treated by Salvarsan, 87
Pfeiffer, J. A. F. Strains of *Treponema pallidum* from Brains of Paretics at Autopsy, 555
Pierce, Bedford. Absence of Proper Facilities for Treatment of Mental Disorders in Early Stages, 93
Pieron, Henri. "Hyperæsthesia" Signifies always Hyperalgesia, 383
Pike, F. H., and Wilson, J. Gordon. Unusual Experimental Lesions of Cerebellum and Medulla Oblongata, 508
Plummer, W. W. Spinal Cord Tumour, 559
Pollock, L., and Potter, H. E. Experimental Injection of Gasserian Ganglion Controlled by Fluoroscopy, 523
Pollosson, P., and Collet, F. J. Continued Partial Epilepsy of Traumatic Origin, 447
Popea, Urechia, and Obregia. Hypophyseal Dystrophy, 521
Porak and Claude. Syndrome of Lesions of Cauda Equina from Gunshot Wounds, 15
Potter, Hollis E., and Pollock, Lewis J. Experimental Injection of Gasserian Ganglion controlled by Fluoroscopy, 523
Potter, N. B. Salvarsan in Treatment of Tuberculosis and Syphilis, 566
Potts, W. A., and Shuttleworth, G. E. Mentally Deficient Children (Review), 333
Preisig, H. Tumour of Ponto-Cerebellar Angle, 389
Preston, George L. Erb-Duchenne Paralysis due to Bullet Wound of Fifth Cervical Nerve, 454
Price, G. E., and M'Iver, J. Drug Addiction, 183
Priestley, J. Common Speech Disorders of Childhood, 530
Proctor, A. P. Three Cases of Concussion Aphasia: Treatment by General Anæsthesia, 25

Proctor, J. A., and Ward, G. Sequel to Epidemic Catarrhal Jaundice, 312
Pruvost, L. P. Mental Defectives in War: their Utilisation, 54
Putnam, James Jackson. Human Motives (Review), 538
Putnam, James W. Unique Murder Case, with New Governing Expert Testimony, 271

QUELLIEN, Rebierre, and Dumolard. Variation in Tendon Reflexes as Sole Objective Sign of Severe Asthenia, &c., 475
Quinau, Clarence. Lipase Studies.—IV. Regional Lipolytic Activity in Normal Human Brain, 378

RADOVICI, A., and Marinesco, G. Cortical Centre for Winking, 512
Rae, James. Shame, 553
Ramond, F. Inclined Ventral Position in Serum Treatment of Cerebro-Spinal Meningitis, 226
Ramond, F., and Résibois, A. Tetragenus Cerebro-Spinal Meningitis, 42
Ramond, F., and Schultz, G. Scarlatinal Neuralgia, 238
Randegger, G. F. Symptoms of Nasal Diphtheria and Nervous Complications of Diphtheria, 115
Ranson, S. W. Unmyelinated Nerve Fibres as Conductors of Protopathic Sensation, 171
Rasch, C. Syphilis: Hypertrophic Cervical Pachymeningitis, 256
Rasmussen, A. Theories of Hibernation, 522
Rasmussen, A. T., and Myers, J. A. Absence of Chromatolytic Change in Central Nervous System of Woodchuck during Hibernation, 372
Rathery, F., and Vansteenberghe, M. Meningeal Syndrome and Azotæmia in Typhoid Fever, 76
Ravaut, P., and Krolunitzky, G. Mumps and Parameningococcus Meningitis. Cure by Intraspinal Injections of Dopter's Antiparameningococcus Serum, 43; Generalised Diphtheritic Paralysis with Meningeal Reaction, 475
Rawling, L. Bathe. Surgery of Head (Review), 241
Ray, L. A., and Robertson, T. Brailsford. Experimental Studies on Growth—I., 166
Rayneau, A. J., and Boutet, A. Congenital Familial Paramyotonia (Eulenburg's Disease). Transitory Rigidity of Muscles from Cold and Damp, 238
Rebierre, Dumolard, and Quellien. Variation in Tendon Reflexes as Sole Objective Sign of Severe Asthenia, &c., 475
Redfield, Caspar L. Extracts from Address before Zoological Department of University of Chicago, 408
Reed, Charles A. L. Diagnostic Methods and Pathologic Constants in Idiopathic Epilepsy, 182
Remsen, Charles M., and Crenshaw, Hansell. Hemiparesis, Ataxia, and Astereognosis with Arachnoidal Œdema, 174
Renner, Dan. S., and Weeks, David F. Raynaud's Disease with Epilepsy, 127
Résibois, A., and Ramond, F. Tetragenus Cerebro-Spinal Meningitis, 42
Retinger, J., and Holmes, B. Cecal Stasis and Dementia Præcox, 573
Revilliod. Left Dorso-Lumbar Transverse Spinal Sclerosis, Post-Traumatic, Curable Type, 511
Rhein, J. H. W. Extra-Pyramidal Motor Disturbances: Case with Autopsy. Lenticulo-Rubro-Cerebello Olivary Degeneration, 80
Ricca, S. Changes in Muscular Contraction in Thomsen's Disease, 512
Ricksher, Charles. Onset of General Paralysis, 91
Rideal, F. K., and Waller, W. Report on "Trench Foot," 223
Riggs, A. F. Treatment of Neurasthenia, 401
Ritchie, J., Smith-Lorrain, J., and Dawson, James. Pathology of Trench Frost-Bite, 34
Roberts, J. E. H. Treatment of Minor Gunshot Wounds of Head, 11
Robertson, A. Rocke. Intraspinal Treatment of Syphilis of Central Nervous System, 393
Robertson, Jane T. High Grade Mental Deficiency, 407
Robertson, T. Brailsford. Experimental Studies on Growth.—II., III., IV., 166; Effects of Tethelin, 168
Robertson, T. Brailsford, and Ray, L. A. Experimental Studies on Growth.—I., 166
Robinson, W., Bolton, Shaw, and Bramwell, B. Bilateral Lesion of Occipital Lobes, with Retention of Macular as distinct from Panoramic Vision, 251
Robinson, W. M. S., and Whitehorne-Cole, A. G. Acute Tetanus, with Recovery, 47
Rogoff, J. M., and Stewart, G. N. Emotional Disturbances on Epinephrin Content of Adrenals, 551

Rolleston, J. D. Transient Hemiplegia in Diphtheria, **145**; Brain of Mongolian Imbecile, 252
Rolleston, H. D. Cerebro-Spinal Fever in Royal Navy, 36
Rosanoff, A. J. Programme of Psychiatric Progress, 188; Intellectual Efficacy in Relation to Insanity, 531
Rosanoff, A. J., and De Fursac, J. Rogues. Manual of Psychiatry (Review), 534
Rosanoff-Saloff and Souques. Camptocormie, 460
Rosenheim, Otto. Galactosides of Brain. —IV. Constitution of Phrenosin and Kerasin, 250
Rosenow, E. C., Towne, E. B., and Wheeler, G. W. Etiology of Epidemic Poliomyelitis, 518
Rosenthal, Joseph. Paralysis of Recurrent Laryngeal Nerve from Mitral Stenosis, 185
Rosenthal, M. I. Removal of Appendix for Cure of Trifacial Neuralgia, 567
Rossi, E. Vertebral Trauma and Lesion of Lower End of Spinal Cord, 308
Rossi, E. Case of Wilson's Disease, 391
Roubinovitch and Soudière, de la. Familial Neurofibromatosis, with Unilateral Cheiromegaly, 513
Rouellen, P., and Sainton, P. Cerebellar Hæmorrhage and Acute Graves' Disease in Cerebro-Spinal Meningitis, 462
Roussy, G., and Boisseau, J. Nervous Symptoms Caused by Bursting of Explosives, 457
Rowe, Albert H. Albumin and Globulin Content of Human Blood Serum, 524
Rows, R. G. Mental Conditions following Strain and Nerve Shock, 220
Rudolf, R. D. Tetanus-like Spasm Localised to Wounded Limb, 46
Russell, W. L. What State Hospital can do in Mental Hygiene, 577
Rutherford, W. J. Meralgia Paræsthetica, 477

SAINTON, P. Subacute Form of Meningococcal Pyarthrosis, 225; Calcified Cyst of Cerebral Ependyma and Tuberculous Meningitis, 471
Sainton, P., and Bosquet, J. Meningococcal Arthritis of Shoulder, Pulmonary Manifestations and Meningitis, &c., 225
Sainton, P., and Huriez, C. Bilateral Paralysis of Brachial Plexus of Upper Root Type in Mumps, 52
Sainton, P., and Maille, J. Meningococcal and Pneumococcal Meningitis in Patient with Chronic Otorrhœa, 116; Meningococcal Meningitis and Tuberculosis, 224
Sainton, P., and Roullen, P. Cerebellar Hæmorrhage and Acute Graves' Disease in Cerebro-Spinal Meningitis, 462
Salmon, Albert. Physiological Theory of Hysteria, 266; Automatism after Muscular Effort in Healthy Subjects, 381
Samuels, William F. General Paralysis in Federated Malay States, 274
Sano, F. Convolutional Pattern of Brains of Identical Twins, 549
Sanphar. Serous Apoplexy from Neo-Salvarsan Cured by Milian's Adrenalin Method, 236
Santee, Harris E. Anatomy of Brain and Spinal Cord (Review), 324
Sanz, E. F. Infantile Spinal Paralysis and Hemiplegia from Cerebral Embolism, 258; Malarial Encephalopathy, 387
Sargent, C. S., and M'Crudden, R. H. Hypoglycæmia and Progressive Muscular Dystrophy, 257
Sargent, G. F., and Dunton, W. R., Jun. Duration of Paresis following Treatment, 572
Sargent, Percy, and Holmes, Gordon. Injuries of Superior Longitudinal Sinus, 5; Treatment of Cranial Injuries of Warfare, 8, 447
Schäfer, Sir Edward A. Endocrine Organs (Review), 139
Scheetz, Mildred E. Sensibility of Nipple Area with Reference to Mental Disease, 272
Schloss, O. M., and Schrœder, L. C. Reducing Substance in Normal and Pathologic Cerebro-Spinal Fluid, 86
Schmidt, Hans, and Weber, F. Parkes. Diabetes Insipidus and Pituitary, 564
Schmidt, P. Pneumococcal and Meningococcal Meningitis after Fracture of Base of Skull, 255
Schneider, C. v. H. Studies on Alcoholic Hallucinoses, 134
Schrœder, L. C., and Schloss, O. M. Reducing Substance in Normal and Pathologic Cerebro-Spinal Fluid, 86
Schulmann, E., and Bloch, M. Zosteriform Eruptions as Episode in Syphilitic Meningitis, 386
Schultz, G., and Ramond, F. Scarlatinal Neuralgia, 238
Schwartz, A. B., and Hoffman, W. O. Permanganate Reduction Index of Cerebro-Spinal Fluid, 124
Scott, H. H. Hyperacute Cerebro-Spinal Meningitis without Cerebral Symptoms: Meningococcus in Blood, 224
Scott, Norman, and Barber, C. H. Severe Tetanus: Recovery after Intra-Cerebral Injection, 47

Scott, R. Lester. Tetanus of Short Incubation Period, with Recovery, 65
Scott, W. M. Meningococci in Spinal Fluid and Similar Organisms in Naso-Pharynx, 465
Scripture, E. W. Reaction Time in Nervous and Mental Diseases, 575
Scripture, May K., and Glogau, O. Speech Conflict. Etiological Factor in Stuttering. Report on 200 Cases, 172
Sequeira, J. H. Sclerodermia in Myxœdema under Thyroid Treatment, 89
Sever, J. Paralytic Conditions from Surgical and Obstetrical Accidents, 258
Sevestre, J., Baur, J., and Hutinel, J. Mild Meningococcal Septicæmia of Intermittent Fever Type following Cerebro-Spinal Meningitis. Recovery, 223
Sharp, J. Gordon. Transient Aphasia, Hemiplegia, and Hemiparesis, due to Arterial Spasm, 79; Atrophy of Thyroid with Hypertrophy of Pituitary, 402
Sharpe, Norman. Treatment of Fracture of Spine, 558
Sharpe, William. Cranial Deformity of Oxycephaly; Operative Treatment, with Cases, 310
Sheill, Spencer. Infantile Tetany, 90
Sherrington, C. S. Postural Activity of Muscle and Nerve, 164
Shuttleworth, G. E. Sequin and Physiological Education, 575
Shuttleworth, G. E., and Potts, W. A. Mentally Deficient Children (Review), 333
Sicard, J. A., and Levy-Valensi, S. Latent Syphilis in Arabs. Reactions in Blood and Cerebro-Spinal Fluid, 394
Siler, J. F., Garrison, P. E., and MacNeal, W. J. History of Pellagrins in Spartanburg County, S.C., who Survived the Initial Attack, 392
Simon, Th., and Binet, A. Development of Intelligence in Children (Review), 578; Intelligence of Feeble-Minded (Review), 578
Simonin and Chavigny. Hysterical Chorea of Diaphragm, 476
Skinner, E. H. Intra-Cranial Aerocele, 176
Smart, Catherine W. Bed-Sores: Their Prevention and Cure (Review), 242
Smith, E. M. Investigation of Mind in Animals (Review), 143
Smith, G. Elliot. Shock and Soldier, 210
Smith, Joseph. Catatonic State in Manic-Depressive Insanity, 187
Smith, J. G. Fatal Case of Poliomyelitis in Adult, 559
Smith, J. W., and MacNeal, W. J. Comparative Methods of Wassermann Tests for Syphilis, 565
Smith, M. Hamblin. Unfitness to Plead in Criminal Trials, 576
Smith, J. Lorrain, Ritchie, J., and Dawson, James. Pathology of Trench Frost-Bite, 34
Smith, S., and Holmes, Gordon. Bilateral Motor Apraxia with Disturbance of Visual Orientation, 201
Snow, C. G., and Cooper, A. T. Wassermann Reaction in Relation to Tuberculosis, 396
Sobrinho, Fonseca. Achilles Reflex, 381
Solling, H. A. Blood Changes in Exophthalmic Goitre, 265
Soudière, de la, and Roubinovitch. Familial Neurofibromatosis, with Unilateral Cheiromegaly, 513
Souques, Baudouin, and Lantuéjoul. Aran-Duchenne Amyotrophy of Syphilitic Origin, 513
Souques and Rosanoff-Saloff. Camptocormie, 460
Southard, E. E., and Canavan, M. M. Focal Lesions of Left Angular Gyrus, Late Catatonia, 132
Spangler, R. H. Blood Findings in Epilepsy, 182
Spence, Harold. 1,000 Intravenous Injections of Galyl, 86
Spikes, W. H. Elementary Text-Book of Psychology (Review), 328
Spiller, William G. Family Form of Pseudo-Sclerosis and other Conditions Attributed to Lenticular Nucleus, 176; Tabetic Ocular Crises, 560
Stearns, A. Warren. Extension of Out-Patient Work in Massachusetts Hospitals for Insane, 94; Defective Delinquents under Massachusetts State Board of Insanity, 137
Steen, R. H. Characteristic Attitude in many Cases of Dementia Præcox, 132
Steindler, A. Direct Neurotization of Paralysed Muscles, 550
Stephens, H. F. Compluetic (Wassermann) Reaction in Amentia, 100 Cases, 566
Stephenson, Sydney. Dyspituitarism in Girl aged 15 Years, 265
Stewart, G. N., and Rogoff, J. M. Emotional Disturbances on Epinephrin of Adrenals, 551
Stewart, Purves. Diagnosis of Nervous Diseases (Review), 533
Stewart, Purves, and Evans, Arthur. Nerve Injuries and their Treatment (Review), 481

Stoddard, James L., and Cutler, Elliott C. Torula Infection in Man (Review), 329

Stokes, John H. Diagnosis of Acute Syphilitic Nephritis and Salvarsan Treatment, 180

Stoney, J. A., and Meade, H. Nerve Suture for Bullet Wounds, 17

Stopford, J. S. B. Arteries of Pons and Medulla Oblongata, I., 155; II., 297; Gunshot Injuries of Peripheral Nerves. Syndrome of Compression, 206

Strohl, A., Barré, J. A., and Guillain, G. Dissociation of Tendo-Achilles Reflex and Mid-Plantar Reflex, 306

Strumpell, A. Severe Optic Neuritis with Cerebellar Ataxia in Pertussis ending in Recovery (Pertussis Encephalitis), 256

Sutherland, H. Etiology and Prevention of Cerebro-Spinal Fever, 38

Swan, R. H. Jocelyn. Gunshot Injuries to Peripheral Nerves, 19; Trench-Foot or so-called Frost-Bite, 30

Swift, Homer F. Study of Serum Salvarsanized *in vitro*, 394

Swift, Walter B. The Possibility of Voice Inheritance, 103; Speech in Athetosis, 151; Voice Sign in Tabes. Technique of Elicitation, 172; Progressive Muscular Atrophy and Treatment, 172; Development of Mental Defective by Vocal Drill, 173; Management of Speech Defect in Public Schools, 321; Voice Defects after Adenoid and Tonsil Operations, 321; Developmental Psychology in Lower Animals and Man, 321

Symington, J. Endocranial Casts and Brain Form: Criticism of recent Speculations, 67

Symmers, D., and Wallace, Guy H. Etiology of Syphilitic Aortitis, 122

TAFT, A. E. Extreme Calcification in Brain of Subject with Mental Symptoms, 57; Focal and General Unilateral Brain Atrophy: Effects upon Corpus Callosum, 243

Tanzi, Eugenio, and Lugaro, Ernesto. Text-Book of Mental Diseases (Review), 97

Taylor, E. W. Recurrent Poliomyelitis: Second Attack after Three Years, 384

Taylor, H. H. Cases of Head Wounds, 10

Taylor, James. Ophthalmological Observations of Hughlings Jackson and Bearing on Nervous and other Diseases, 263; Nervous and other Medical Disorders seen at Eye Hospital, 264

Thom, D. A. Abnormal Relation between Liver and Brain Weights in Forty-two Cases of Epilepsy, 320

Thom, D. A., and Card, H. Bacteriological Study of Blood of Seventy Epileptics, 529

Thomas, D. J., Lundie, Alex., and Fleming, S. Pleomorphism of Meningococcus, 41

Thomas, H. B. Paralysis of Poliomyelitis, 385

Thomas, J. Lynn. Peripheral Shock and Central Effects, 209

Thomson, D. G. Conversion of Country Asylum into War Hospital, 223

Thomson, John. Myotonia Congenita (Thomsen's Disease) in Child, 113

Thompson, Peter. Studies in Anatomy (Review), 275

Thorne, F. H., and Evans, B. D. Treatment of Paresis, 270

Tieken, Theodore. Addison's Disease: Acute Onset, Terminating in Rapid Improvement and Complete Recovery, 402

Tilley, Herbert. Two Cases of Functional Aphonia (one with Functional Deafness) following Bursting of Shell, 25

Tilney, Frederick. Clinical Myosthenometer and Reflex Liminometer, 70

Tinel, J. Wounds of Nerves (Review), 479

Tisdall, C. T., and Cruickshank, J. Cholesterol Content of Serum in Mental Diseases, 134

Tockmann and Massary, E. de. Statistics of 243 Soldiers Suffering from Mumps. Frequency of Orchitis and Meningeal Reactions, 471

Tolmer and Weissenbach. Acute Primary Cerebro-Spinal Meningitis Due to Paratyphoid A, 42, 227

Tombleson, J. Bennett. Military Cases Treated by Hypnotic Suggestion, 457

Torrey, Robert G. Influenzal Meningitis, 385

Towne, E. B., Wheeler, G. W., and Rosenow, E. C. Etiology of Epidemic Poliomyelitis, 518

Trocello, E. Longitudinal Radial Ectromelus, 563

Troell, A. Attempts to Produce Exophthalmos Experimentally, 181

Trotter, Wilfred. Instincts of Herd in Peace and War (Review), 279; Recurrent Herpes Zoster of Face with Hemiatrophy, 72

Turner, C. Violet. Prolonged Hyperpyrexia in Child with Mid-Brain Tumour, 520

Turrell, W. J. Electrical Treatment of Trench-Foot and Frost-Bite, 34

URECHIA, Obregia, and Popea. Hypophyseal Dystrophy, 521

VACHET, P. Mental Disturbances ollowing Shock of Modern Explosives, 221
Vandenbossche. Contused Wound of Two Cerebral Hemispheres by Fragment of Shell; Lesion of Superior Longitudinal Sinus, &c.; Recovery, 7
Vansteenberghe, M., and Rathery, F. Meningeal Syndrome and Azotæmia in Typhoid Fever, 76
Vedder, E. B. Dietary Deficiency as Etiological Factor in Pellagra, 391
Verbeck, P. G. A. Facial Neuralgia with Paralysis (Painful Facial Paralysis of Diculafoy-Testaz) in Tertiary Syphilis, 318
Verger, H. Desertion in Presence of Enemy in Epileptic Fugue, 237
Vianna, U., and Moreira, J. Causes of General Paralysis in Rio de Janeiro, 571
Vidoni, Giuseppe. Antityphoid Inoculation in Mental Disease, 136
Vilvandré, George. Radiography in Gunshot Wounds of Skull, 199
Vincent, Wm. Asylums as Military Hospitals, 223
Voisin, R. Fatal Meningitis in Mumps, 228
Voorhees, I. W. Fatality following Acute Otitis Media, 561

WALLACE, CH. Orthopædics in Treatment of Anterior Poliomyelitis, 518.
Wallace, Guy H., and Symmers, D. Etiology of Syphilitic Aortitis, 122
Wallace, Robertson. Nervous Disorders of Modern Life (Review), 336
Walker, I. C., and Haller, D. A. Treatment of Syphilis of Central Nervous System with Intravenous Salvarsan, with Intravenous Salvarsan and Intraspinal Salvarsanized Serum, and with Intraspinal Salvarsanized Serum, 393
Waller, W., and Rideal, F. K. Report on "Trench Foot," 223
Ward, G., and Procter, J. A. Sequel to Epidemic Catarrhal Jaundice, 312
Wardner, Drew M. Intra-Cranial Injection of Salvarsanized Serum, 271
Waters, L. R. Sixty-four Cases of Epilepsy in Patients from Fourteen Years to Forty, 399
Watson-Williams, P. Technique of Sphenoidal Sinus Exploration for Meningococcal and other Infections, 464
Weakley, Leonard. Metastatic Endophthalmitis in Cerebro-Spinal Meningitis, 226
Weber, F. Parkes. Herpes Zoster and Paralysis of Arm, 72; Case of Acromegaly, 118; Two Cases of Herpes Zoster, with General Eruption of Varicella-like Spots, 383; Thrombo-Angiitis Obliterans, 568
Weber, F. Parkes, and Schmidt, Hans. Diabetes Insipidus, with Peculiar Finding in Pituitary, 564
Weed, Lewis H., and Muller, Henry R. Reflex of Cats, 374
Weeks, D. F., and Renner, D. S. Raynaud's Disease, with Epilepsy, 127
Weinstein, J. Herpes Zoster presenting Multiple Symptoms, and simulating Mastoiditis, 171
Weisenburg, T. H. Value of Defence and Muscle Reflexes in Spinal Localisation, 382
Weissenbach and Boidin. Localised Meningitis of Base. Puriform Aseptic Reaction of Cerebro-Spinal Fluid. Meningococcal Septicæmia. Recovery, 116
Weissenbach and Tolmer. Acute Primar Cerebro-Spinal Meningitis due to Paratyphoid A, 42, 227
Wells, C. W. Immune Human Serum in Treatment of Acute Poliomyelitis, 517
Weston, Paul G. Colloidal Gold Precipitating Substance in Cerebro-Spinal Fluid in Paresis, 269; Sugar Content of Blood and Spinal Fluid of Insane, 525
Whale, H. L. Functional Aphonia, 208
Wheeler, G. W., Rosenow, E. C., and Towne, E. B. Etiology of Epidemic Poliomyelitis, 518
Wherry, W. B., and Oliver, W. W. Blood Cultures in Epilepsy, 528
Whipham, T. R. Congenital Word and Letter Blindness, 260
White, J. Renfrew. Extent and Nature of Sensory Loss in Musculospiral Paresis, 453
White, Wm. A. Dangers of Continuous Bath, 138; Symbolism, 169; Critical Historical Review—Reil's Rhapsodieen, 186
Whitehorn-Cole, A. G. Surgical Notes on Serious Head Injuries, 10
Whitehorne-Cole, A. G., and Robinson, W. M. S. Acute Tetanus with Recovery, 47
Wholey, C. C. Nerve Tissue Involvement from Syphilis of Vertebræ, 179
Wilcox, Wm. Henry. Beri-Beri, with Reference to Prophylaxis and Treatment, 239

Wile, Udo J. Experimental Syphilis in Rabbit produced by Brain Substance of Living Paretic, 129

Wile, Udo J., and Kruif, P. H. de. Cultural Experiments with *Spirochæta pallida* from Paretic Brain, 130

Williams, E. C. Eleven Cases of Cerebro-Spinal Meningitis, 256

Williams, F. E. Psychopathic Hospitals and Prophylaxis, 188

Willis, A. M., and Hanes, Fred. M. Cysts of Leptomeninges. Successful Operative Case, 558

Wilson, J. A. Nystagmus and Allied Conditions, 184

Wilson, J. Gordon, and Pike, F. H. Unusual Experimental Lesions of Cerebellum and Medulla Oblongata, 508

Wilson, Louis B. Changes in Sympathetic Ganglia in Exophthalmic Goitre, 554

Wiltshire, Harold. Etiology of Shell Shock, 455

Woerkom, W. van. Motor Disturbances in Bilateral Lesion of Corpus Striatum, 520

Wollstein, Martha, and Amoss, Harold A. Rapid Preparation of Anti-Meningitis Serum, 229

Wood, E. J. Etiology of Pellagra : Vitamin Deficiency, 565

Woods, R. S., and Eve, Sir Fred. Operative Treatment of Gunshot Injuries of Nerves, 18

Worster-Drought, C. Treatment of Cerebro-Spinal Fever, 463

YOUNG, MEREDITH. Mentally Defective Child (Review), 537

ZAMBONI, G. Nervous Complications of Whooping-Cough (Multiple Sclerosis), 313

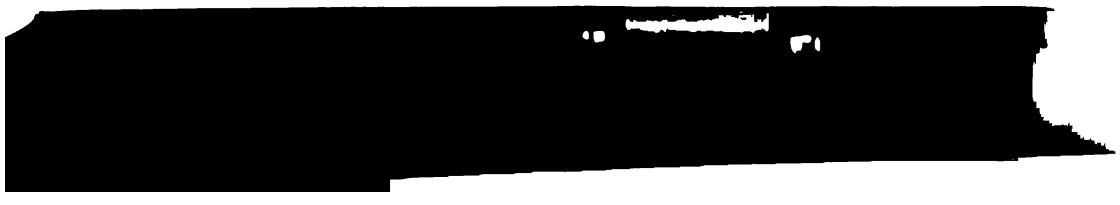
Zilva, S. S., and MacConkey, A. T. Iodine in Tetanus, 235

Zinsser, Hans, and Hopkins, J. G. *Treponema pallidum* and Syphilis. II. Spirochæticidal Antibodies against *Treponema pallidum*, 122

Zinsser, Hans, Hopkins, J. G., and M'Burney, M. *Treponema pallidum* and Syphilis. III. Fluctuations in Virulence of *Treponema pallidum* Strains passed through Rabbits, 123. IV. Difference between Cultivated Non-Virulent *Treponema pallidum* and Virulent Treponemata from Lesions, 123

Zinsser, Hans, Hopkins, J. G., and Ottenberg, R. Laboratory Course in Serum Study (Review), 284

Printed at THE DARIEN PRESS, *Edinburgh.*



ONE DAY

ONE-DAY BOOK

This book is issued for one-day use and is due before closing time on the following day.

If not returned on the date due, it will incur a fine of 25 cents per day until returned. If not returned by the fourth day overdue, the book will be replaced at the borrower's expense.

BIOLOGY LIBRARY

351522

Review

RC321
R4
v.14

Permanent

ONE DAY

UNIVERSITY OF CALIFORNIA LIBRARY

ONE DAY